ROYAL BOTANIC GARDENS, KEW.

BULLETIN

OF

MISCELLANEOUS INFORMATION.

No. 1.] [1911.

# I.—CONTRIBUTIONS TO THE FLORA OF SIAM.

## I.—Sketch of the Vegetation of Chiengmai.

A. F. G. Kerr.

Chiengmai, the capital of Northern Siam, lies about 1000 ft. above sea-level, approximately in Lat. 18° 50′ N., Long. 99° 0′ E., and is situated on the banks of the Meh Ping, which here traverses a valley nearly 120 miles long but not more than 20 or 30 miles at its broadest, reaching from the Chieng Dao gorge in the north to the Meh Ping rapids in the south. This valley, an alluvial plain almost wholly under rice cultivation, is bounded on the east by the mountains of the Meh Ping—Meh Wang watershed, and on the west by those of the Salween—Meh Ping watershed. The mountains on the west are the higher, among them being Doi Intanon, which reaches a height of 8400 ft. and is the highest mountain in Siam, and Doi Sootep 5500 ft.

Doi Sootep, with whose vegetation I will chiefly deal, is composed of metamorphic rock, overlain in most places by red clay. It stands more to the east than the general line of the range, but is not actually isolated, and has two peaks, both practically the same height, and about a mile apart, the ridge connecting them dropping about 500 or 600 ft.

Chiengmai lies somewhat to the north and a good deal to the west of the centre of this valley, about two miles from the foot of Doi Sootep.

### Climate.

The year may be divided into three seasons : a hot season lasting from the middle of February to the middle of May, a rainy season from the middle of May to the end of October, and a cold

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season from November to the middle of February. The following table gives the main meteorological features for the year :—

*Meteorological Record taken at Chiengmai.*

April, 1909–March, 1910.

| Temperatures, Fahr. | 1909. | | | | | | | | | 1910. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Jan. | Feb. | Mar. |
| Mean Shade | 87·02 | 86·39 | 86·09 | 83·12 | 83·95 | 83·21 | 83·67 | 76·25 | 71·95 | 74·21 | 76·20 | 78·81 |
| Mean Daily Range. | 33·35 | 24·67 | 22·52 | 20·40 | 21·45 | 20·68 | 22·32 | 20·31 | 32·90 | 36·76 | 36·48 | 32·55 |
| HighestShade | 108·8 | 107·5 | 103·0 | 104·5 | 104·0 | 102·5 | 102·0 | 93·0 | 93·0 | 96·0 | 100·5 | 103·5 |
| Lowest Shade | 67·0 | 69·0 | 72·0 | 69·0 | 70·0 | 70·5 | 70·0 | 57·0 | 50·5 | 46·5 | 48·5 | 54·0 |
| Highest Sun | 152 | 152 | 146 | 140 | 142 | 143 | 143 | 138 | 128 | 129 | 141 | 140 |
| Rainfall in inches. | 0·79 | 4·69 | 3·29 | 14·60 | 9·94 | 10·33 | 7·71 | 2·31 | 0 | 0 | 0·03 | 3·91 |
| Number of days on which rain fell. | 10 | 19 | 16 | 24 | 23 | 19 | 14 | 7 | 0 | 0 | 1 | 6 |

Mean Shade Temperature for the year ... 89·91° F.
Total Rainfall for the year ... ... ... 57·628 inches.

The Mean Shade Temperatures are calculated from the maxima and minima only.

So far I have a meteorological record for one year only, which is, on the whole, a fairly average one with the exception of the rainfall, which was unusually large in the hot season of this year. Owing to the kindness of the Borneo Company, Ltd., Chiengmai, I am enabled to give the average monthly rainfall for the nine years 1901–1909 :—

| | | |
|---|---|---|
| January–April ... ... ... | 1·701 | inches. |
| May ... ... ... ... | 6·809 | „ |
| June ... ... ... ... | 5·638 | „ |
| July ... ... ... ... | 7·397 | „ |
| August ... ... ... ... | 9·862 | „ |
| September ... ... ... | 10·191 | „ |
| October ... ... ... ... | 7·351 | „ |
| November... ... ... ... | 1·994 | „ |
| December... ... ... ... | ·342 | „ |
| Average yearly rainfall ... | 51·285 | „ |

The temperature at higher altitudes on the mountains is very much cooler than at Chiengmai, and I think it probable that, at and near the top of Doi Sootep, frosts are not uncommon in the cold season. On the same range, but about 50 miles south of Chiengmai, at an altitude of about 3000 ft., I myself experienced a sharp frost one night in January.

## Character of the Vegetation.

I propose to limit my remarks chiefly to the vegetation of Doi Sootep as most of my collecting has been done on that mountain.

Chiengmai itself is surrounded by rice fields, but here and there occur patches, which have either gone out of cultivation, or are not considered worth cultivating. These patches are usually covered with a scrub jungle, consisting for the most part of a small thorny bamboo, bushes of *Capparis tenera* and *Zizyphus Jujuba*, with scattered trees of *Butea frondosa*, *Bombax malabaricum* and *Acacia Catechu*. In the rains these bushes are frequently covered with climbers, various species of *Cissus* (*C. adnata*, *C. assamica*, *C. Kerrii*), *Dioscorea*, and several of the *Cucurbitaceae*.

There is a fringe of this scrub jungle in many places at the foot of Doi Sootep; passing through it one enters a mixed jungle of medium-sized trees. This jungle is composed partly of deciduous and partly of evergreen trees, the soil being, as a rule, loam, and the ground fairly level. There is a well developed undergrowth of herbaceous plants and shrubs, several woody climbers find support on the trees, and there are a few epiphytes. Among the trees characteristic of this jungle may be mentioned Teak, *Protium serratum*, *Eugenia fruticosa*, *Schleichera trijuga*, *Casearia Kerrii*, *Irvingia malayana*, *Pterospermum semisagittatum*, and *Shorea floribunda*. The teak trees grow to no great height here, and are usually misshapen, probably owing to unsuitable soil, or to the constant hacking of passing natives. Most of the shrubs produce only annual shoots from a woody rootstock, the fires of the dry season preventing any further development; such are *Brucea sumatrana*, *Desmodium longipes*, *Clerodendron serratum* and *Hibiscus cancellatus*. *Aganosma marginata*, *Celastrus paniculata*, *Acacia pennata*, *Calycopteris floribunda* and *Harrisonia Bennettii* are the chief woody climbers. A plentiful growth of herbaceous plants comes up in the rains, including several ground orchids, *Habenaria Helferi*, *Peristylus constrictus* and two or three species of *Pogonia*, and many other plants such as *Zingiber Zerumbet*, *Clerodendron diversifolia* and *Inula polygonata*.

This jungle extends to the foot of the first steep slope, where it gives place to the deciduous jungle known in this country as "Pah Paa" and in Burma as "Eng Jungle." The pah paa extends up the mountain to an altitude of about 2000 ft.; its characteristic trees belong to the *Dipterocarpaceae*, the prevailing species varying with the nature of the soil, and the slope of the ground. There are certain features common to the different forms of pah paa. The jungle is open, the ground being either bare and stony, or covered with a tufty growth of grass; epiphytes abound, but there are few or no woody climbers. Where the ground is very stony the jungle is composed chiefly of stunted trees of *Pentacme siamensis*—75 per cent. of all the trees present may belong to this species. These trees are much infested by such parasites as *Loranthus* and *Viscum*. Occasionally, on somewhat similar ground, *Shorea obtusa* is found as the predominant tree, but intermixed with *Pentacme siamensis*.

On red soil, and particularly where the slope is not very steep, the pah paa has a much greater variety of trees ; here *Dipterocarpus tuberculatus* is one of the most noticeable trees and reaches a large size as does also *Dipterocarpus obtusifolius*, and sometimes *Melanorrhoea usitata*, but most of the other trees, such as *Shorea obtusa*, *Quercus Helferiana*, *Buchanania latifolia*, *Diospyros ehretioides*, *Strychnos Nux-vomica*, and many others, are small. Here again most of the shrubs are burnt down to the ground in the hot season, throwing up fresh shoots in the rains, *Ochna Wallichii*, which sometimes grows out into a small tree, *Ellipeia chereevensis*, *Blinkworthia lycioides* and *Clausena excavata* being the commonest. The ground is covered with a tufted growth of grasses and cyperads, amongst which numerous herbaceous plants spring up during the rains. A considerable number of these, belonging to various natural orders, have grass-like leaves and they are nearly all perennials with tuberous roots, annuals being rare. Many have conspicuous flowers such as the orchids *Spathoglottis pubescens* and *Eulophia graminea*, the pretty blue iris (*I. Collettii*), whose flowers open in the afternoon, *Curcuma sessilis*, *Crotalaria neriifolia*, *Barleria cristata*, *Vernonia teres*, and *Striga Masuria*. Epiphytes are abundant ; particularly noticeable is the curious *Dischidia Rafflesiana* with its clusters of pitcher leaves, which are not, by the way, used for storing water, forming extensive growths on *Dipterocarpus tuberculatus*. Other common epiphytes are a species of *Hoya*, and numerous orchids—of which *Dendrobium secundum*, *Dendrobium Draconis*, *Eria Griffithii*, *Aerides multiflorum*, *Bromheadia aporoides* and *Sarcanthus Williamsoni* are among the commonest.

Above 2000 ft., the typical pah paa is succeeded by a jungle with a great variety of trees, many of them lofty, a considerable undergrowth of shrubs and herbs, many woody climbers and numerous epiphytes. This jungle, which might be called an oak jungle from the number of species of *Quercus* and *Castanopsis* occurring in it, is also subject to forest fires, but is not so completely burnt as the jungles below. There is a mixture of deciduous and evergreen trees, the most abundant being several species of *Quercus* and *Castanopsis*, *Gmelina arborea*, *Bauhinia variegata*, *Cassia Fistula*, *Schima Wallichii*, and *Lagerstroemia Balansae*. A number of the trees support such woody climbers as *Dalbergia stipulacea*, *Celastrus paniculata*, *Millettia auriculata*, var. *extensa* and *Hiptage Madablota*. Here also most of the herbs are perennials with tuberous roots, conspicuous being several Scitaminads, *Gagnepainia* sp., *Curcuma* sp. and *Kaempferia rotunda*, flowering towards the end of the dry season, after the fires, their leaves not appearing till the rains. Among other herbs found are *Cynoglossum micranthum*, *Disporum calcaratum*, *Hapaline Benthamiana* and *Eulophia nuda*. The epiphytes are chiefly orchids, many with very fine flowers as *Dendrobium gratiosissimum*, *Dendrobium aggregatum*, the curious little hairy *Dendrobium sessile*, *Coelogyne Rhodeana*, and *Vanda Parishii*. There are also a few epiphytic ferns. This jungle is found in open valleys, and on moderate slopes from about 2000 to 3000 ft. In the narrower valleys and near streams the jungle is more decidedly evergreen

OPEN GRASSY JUNGLE, 5200 ft.



[*To face page* 4.

EVERGREEN JUNGLE, 5400 ft.

*To face page* 5.]

with such trees as *Talauma Hodgsoni*, *Hopea odorata*, *Garcinia cornea*, *Diospyros* sp. and *Baccaurea sapida*. Here appears *Vanilla siamensis*, which often covers the tree trunks to a height of 50 feet or more with its thick leathery looking leaves, and which is known to the natives as Ploo chang or the elephant's betel vine, and also, though rarely, a curious leafless orchid, *Galeola* sp., of which I have not yet been able to find good flowering material.

Where the slope is steep, and on the tops of the spurs, an open grassy jungle, similar to the pah paa of the lower slopes, is found with *Dipterocarpus obtusifolius* as the predominant tree ; associated with it are several oaks, and a few trees of *Pentacme siamensis* and *Shorea obtusa* growing to a larger size than on the lower slopes, but no *Dipterocarpus tuberculatus*. There are very few woody climbers, but a good many epiphytes, chiefly orchids similar to those found in the pah paa below, with the addition of *Bulbophyllum nigrescens*, and *Saccolabium fragrans*. The soil is usually sand or red clay. At about 3000 ft., the upper limits of this jungle, *Pinus Khasya* is first met with.

Above 3000 ft., and to about 4500 ft., we find the open valleys and moderate slopes clothed with an evergreen jungle, recalling the European backwood in summer, predominant being a lofty tree, *Quercus Junghuhnii*, with a smooth grey lichen-blotched bole, while, to enhance the resemblance, *Hypopitys lanuginosa*, so like the *Hypopitys multiflora* of the English woods, is not uncommon on the humus. The nut of *Quercus Junghuhnii*, called by the Laos "Mākan Dohey," is eaten and greatly esteemed by the natives. Other trees found here are *Carpinus viminea*, *Rhododendron oxyphyllum* and *Vaccinium exaristatum*. There is a considerable undergrowth of small shrubs, such as *Pithecolobium glomeriflorum* and *Evodia triphylla*, interlaced with *Smilax lanceaefolia* and other weak prickly climbers, large woody climbers being very scarce. There are a few herbs, most of them with inconspicuous flowers, *Arisaema Jacquemontii*, *Vernonia chinensis* and a saprophytic *Aphyllorchis* being the most common. Epiphytes, mostly ferns, are not numerous ; a species of *Cymbidium* is also found. A thick layer of humus covers the ground, and is usually underlain by red clay.

Near streams, and in narrow valleys this type of jungle gives place to a dense evergreen jungle with a great variety of tall trees, very few of which I have been able to collect, numerous climbers, including a *Calamus*, and a dense undergrowth, in which a small palm, a species of *Musa* and tall Scitaminads abound.

At higher altitudes, almost to the summit, 5500 ft., we find again an open grassy jungle on the slopes, and here along the crests of ridges *Pinus Khasya*, growing to a large size, is the most noticeable tree. Most of the associated trees are small, particularly when situated on exposed ridges ; *Pieris ovalifolia*, *Helicia erratica* and a small oak, are the commonest of these trees. We meet with two trees here, *Phyllanthus emblica* and *Anneslea fragrans*, also found in the pah paa of the lower slopes, and at least one herb from that jungle reappears here, *Polygala triphylla*. Scattered among the grass are small shrubs with bright flowers, *Desmodium oblongum* and *Osbeckia*

*crinita*, and numerous herbaceous plants, many of them belonging to temperate genera and usually with conspicuous flowers, among which *Lilium nepalense*, *Drosera peltata*, whose small white flowers dot the grass in all directions in July, *Sonerila Kerrii*, *Valeriana Hardwickii*, *Swertia pulchella*, and *Paris polyphylla* may be mentioned. There are no woody climbers but many of the trees are loaded with orchids and ferns, the commonest being two species of *Bulbophyllum*, *Cirrhopetalum papillosum*, *Coelogyne siamensis*, *Dendrobium bellatulum* and *Pholidota obovata*.

At or near the top of the mountain, where the ground is fairly level and the humus can collect, we find the most luxuriant vegetation to be seen on the whole of Doi Sootep, every bit of available space being occupied by plant life. The trees, *Pyrenaria camelliaeflora*, *Adinandra integerrima*, *Litsaea salicifolia*, and very many others I have not collected, are of medium size and their stems are clothed, as are the numerous lianes, with epiphytic mosses, ferns, asclepiads, gesnerads, orchids and ericaceous shrubs. The ground beneath is covered with a growth of *Scitamineae* and *Acanthaceae*, while the prickly tangled stems of *Smilax lanceaefolia* and *Rubus Kerrii* make progress difficult and painful. *Agapetes Hosseana*, which forms large nodular woody masses, sometimes as large as a man's head, on the branches of trees, and the beautiful white-flowered *Rhododendron Veitchianum* are the commonest of the epiphytic shrubs. Many of the trees are also burthened with immense masses of the orchid, *Otochilus alba*, other orchids here worthy of mention being *Monomeria barbata*, *Eria barbata*, *Dendrobium bicameratum*, *Dendrobium Falconeri*, and *Dendrobium ochreatum*.

At the actual summit is an area of open jungle covered with tall pampas grass studded with low spreading trees of a species of *Glochidion*. This I believe to be a secondary growth on an old clearing made for survey purposes.

Clearings are frequently made lower down at from 2000 to 3000 ft. for the cultivation of mountain rice. These clearings, known as Hais, are abandoned after one crop has been obtained, and become quickly covered with secondary growth. This growth assumes different types, no doubt controlled by various factors such as soil, slope, neighbouring vegetation, &c. In some places a grass, *Imperata arundinacea*, overspreads the clearings, which may then remain in this condition for years ; this grass, known to the natives as Yah Kah, is cut down yearly, being used for thatching. Frequently the earliest growth is of coarse Composites, *Erigeron linifolium* and *Eupatorium odoratum*. When the latter appears it chokes most of the other vegetation with its tangled impenetrable growth. Many old clearings are covered with an almost pure growth of a small tree, *Trema amboinensis*. A secondary growth of bamboo, common in other districts, is not often seen on Doi Sootep. In time, no doubt, most of these clearings return to the original jungle.

I have attempted to sketch only the leading types of vegetation on Doi Sootep, but many others are to be met with, such as open marshes and evergreen swamps. In many places, too, the types of vegetation I have described are found more or less intermixed.

## II. List of Siamese Plants with descriptions of new species.

W. G. Craib.

At the present time the only guide to the Flora of Siam is the list compiled by Dr. Williams and published in Bull. Herb. Boiss. (1904–05), a list which, in view of more recent collections, must be regarded as very incompletely representing the flora of that country. At the time that Dr. Williams was compiling his list Northern Siam was practically unrepresented in the Kew Herbarium, with the result that his list unduly emphasises the Malay Peninsula element in the flora.

Quite recently, however, some very important additions have been made to our botanical knowledge of that part of the country. In 1904–05 Dr. C. C. Hosseus made a large collection of plants, chiefly in N.W. Siam, and a fairly complete set of his plants is preserved in the Kew Herbarium. Lately large collections have been and are still being received at Kew from Dr. A. F. G. Kerr from the same district but mostly from Doi Sootep, a mountain near Chiengmai. Dr. Kerr has the great advantage of being resident in the district—an advantage which can hardly be overestimated when it is remembered that botanically the district is practically unknown. This has enabled Dr. Kerr, who is a keen and careful collector, to forward very complete material to Kew. The officers of the Siamese Forest Service have also commenced the botanical investigation of their districts, as shewn by a small consignment of specimens lately received. It is to be earnestly hoped that the officers concerned may pursue the good work thus begun.

The present list which, it is hoped, may be completed this year, is to be regarded as additional to the list published by Dr. Williams. In order, however, to illustrate as fully as possible Dr. Kerr's introduction, dealing with the botany of his district, all Dr. Kerr's specimens are quoted, whether the species has already appeared in Dr. Williams' list or not. In cases where the species has already been included by Dr. Williams a reference will be found to his list.

Besides the collections already referred to, a small collection made by Mr. D. O. Witt, chiefly in Southern Siam, and several specimens of the older collections which had been overlooked by Dr. Williams have been included.

Chiengmai, in its flora, shows a strong affinity with Upper Burma and Yunnan—as might be expected from its geographical position. Several of the new species described from the Shan States by Collett and Hemsley in Journ. Linn. Soc., vol. xxviii., *e.g. Phylacium majus*, *Lonicera Hildebrandiana*, &c., have been collected by Dr. Kerr, and again a large collection from Burma made by Mr. J. H. Lace includes *Grewia Lacei*, *Modecca pinnatisecta*, *Lagerstroemia Collettii*, *Osbeckia rostrata*, &c., species which were originally described for the present paper from Dr. Kerr's specimens.

Throughout the list references have been given to Hooker's Flora of British India (contracted F.B.I.), to Kurz's Forest Flora of

Burma (contracted For. Fl. Burma), and to Collett and Hemsley's paper on the Flora of the Shan States published in the Journal of the Linnean Society. References have also been given to Lecomte's Flore Generale de l'Indo-Chine so far as that work has been published (contracted Fl. Indo-Chine), and to various other papers which serve in the writer's opinion to throw light on the species under consideration.

The distribution of the species is taken, except when otherwise stated, from specimens in the Kew Herbarium. Several species are quoted, of which no specimens from Siam have been seen, but in such cases the authority for the record is alone quoted.

The sequence of Bentham and Hooker's Genera Plantarum is followed on the whole and the species are arranged alphabetically under the genera.

As Dr. Kerr is still forwarding large collections the present instalment, which deals with the Polypetalae, includes the specimens received at Kew up to the end of the year 1910.

New species which have already been published are denoted by an asterisk (*).

The Lao names, except when otherwise stated, are taken from Dr. Kerr's notes.

## POLYPETALAE.

### Ranunculaceae.

**Clematis smilacifolia**, *Wall.*—F.B.I., i. p. 3 ; For. Fl. Burma, i. p. 16 ; Williams, Bull. Herb. Boiss., v. (1905) p. 22 ; Fl. Indo-Chine, i. p. 3.

Chiengmai, Doi Sootep, 500–700 m., *Hosseus*, 297.

*Distr.* India, China, Tonkin, Malaya.

### Dilleniaceae.

**Tetracera sarmentosa**, *Vahl*, var. **Loureiri**, *Finet et Gagnep.*—Fl. Indo-Chine, i. p. 16.

Bangkok, *Zimmermann*, 74.

*Distr.* (of var.). Cambodia, Cochinchina, Malay Peninsula.

**Dillenia Kerrii**, *Craib*, sp. n., ab affini *D. scabrella*, Roxb., floribus majoribus, pedicellis brevioribus facile distinguenda.

*Arbor* decidua, ramulis crassis primo breviter appresse fulvo-pubescentibus mox glabris. *Folia* elliptica, utrinque rotundata sed basi rarissime inaequalia cuneata, 28·5–30 cm. longa, 14·2–17·2 cm. lata, chartacea vel subcoriacea, supra nervis nervulisque pilis brevibus rigidiusculis parce instructa, subtus costa nervisque primariis fulvo-pilosa, nervulis ut in pagina superiore, nervis lateralibus utrinque ultra 40 ad marginem simplicibus inter se 5–7 mm. distantibus, cum costa supra conspicuis subtus prominentibus nervis transversis subtus prominulis, margine nervis excurrentibus denticulata ; petioli 4·5–6·5 cm. longi, supra valde canaliculati, basi dilatati, ut in costa appresse fulvo-pubescentes. *Flores* mane expansi (*ex Kerr*), plerumque gemini, ramulis brevissimis ligno anni praeteriti exoreuntes ; pedicelli 1·5–2·5 cm. longi, crassiusculi, densius puberuli, apicem versus bracteola ovato-lanceolata obtusa 9 mm. longa 6 mm. lata instructi. *Sepala* exteriora

maxima, rotundata, circiter 1·4 cm. diametro, interiora late elliptica, 1·7 cm. longa, 1·2 cm. lata, coriacea, ciliata, extus appresse pubescentia, intus glabra margines apicesque versus parce brevissime pilulosa. *Petala* sulphurea (*ex Kerr*), obovata, apice rotundata, basi cuneata vix stipitata vel interdum in unguem distinctum contracta, 2·5–2·6 cm. longa, 1·4–1·5 cm. lata, utrinque glabra, distincte nervata. *Ovarium* e carpellis 6 constitutum, 8 mm. altum, superne appresse albo-pubescens ; styli 8 mm. longi, uncinati, glabri.

Hills between Muang Prow and Chieng Dao, 600 m., in mixed jungle, *Kerr*, 1046.

*Distr.* Burma, *Kurz*, *Robertson*, 140 ?

The specimen collected by Kurz in Burma was named *D. parviflora*, and it is possible that this plant may be the *D. parviflora*, Kurz, For. Fl. Burma, I. p. 21 *non* Griff. From Griffith's species *D. Kerrii* is readily distinguished by its larger flowers and by the very different shape and indumentum of the sepals.

**Dillenia pulcherrima**, *Kurz*—F.B.I., i. p. 37 ; For. Fl. Burma, i. p. 19 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 16.

Meh Fang, 360 m., *Kerr*, 1063.

*Distr.* Burma.

Lao name, Mă San Quang.

## Magnoliaceae.

**Talauma Hodgsoni**, *Hook f. et Th.*—F.B.I., i. p. 40.

Chiengmai, evergreen jungle on Doi Sootep, 660–900 m., *Kerr*, 1098.

*Distr.* Sikkim, Khasia, Upper Burma.

Lao name, Boon Tah.

**Michelia Champaca**, *Linn.*—F.B.I., i. p. 42 ; For. Fl. Burma, i. p. 25 ; Williams, Bull. Herb. Boiss., v. (1905) p. 23 ; Fl. Indo-Chine, i. p. 38.

Chiengmai, Doi Sootep, 900–1140 m., *Kerr*, 1279, *Hosseus*, 480.

*Distr.* India, Yunnan, throughout Indo-China, Malaya.

Lao name, Chum Pi (ex *Kerr*).

## Anonaceae.

**Uvaria rufa**, *Blume*—Williams, Bull. Herb. Boiss., v. (1905) p. 23 ; Fl. Indo-Chine, i. p. 51.

Chiengmai, in scrub jungle at foot of Doi Sootep, 300 m., *Kerr*, 660.

*Distr.* Cochinchina, Java.

**Ellipeia cherrevensis**, *Pierre ex Finet et Gagnep.*—Fl. Indo-Chine, i. p. 58.

Chiengmai, in deciduous jungle on Doi Sootep, 300–450 m., *Kerr*, 636—"a few twigs about 45 cm. high from a perennial rootstock."

*Distr.* Cambodia.

**Artabotrys burmanicus**, *DC.*—F.B.I., i. p. 55 ; For. Fl. Burma, i. p. 32 ; Fl. Indo-Chine, i. p. 81.

Petchabouri (ex Fl. Indo-Chine, l.c.).

**Unona dubia**, *Craib*, sp. n., a speciebus ceteris carpellis 4 tantum distincta.

*Fruticulus* 45 cm. altus (*ex Kerr*) ; ramuli ad 2·5 mm. diametro, primo tomentelli, demum glabri, cortice rubro-brunneo. *Folia* oblonga, oblanceolata vel oblongo-oblanceolata, apice obtusa vel brevissime obtuse acuminata, basi rotundata vel leviter cordata, 3·6–12·5 cm. longa, 1·5–4·7 cm. lata, supra glabra, subtus molliter pubescentia, rigide chartacea, integra, nervis lateralibus utrinque circiter 8 intra marginem arcuatis supra leviter impressis subtus prominulis ; petioli crassiusculi, 3 mm. longi, tomentelli. *Flores* plerumque solitarii, ex axillis veteribus pedicellis brevibus. *Sepala* 3, late deltoidea, 2 mm. longa, fere 2 mm. lata, extra fulvo-tomentella. *Petala* 6, 2-seriata, subaequalia, ovata vel ovato-lanceolata, obtusa, 5–8 mm. longa, 4 mm. lata, extus fulvo-pilulosa, intus glabra. *Stamina* ∞, filamentis productis truncatis antheras obtegentibus. *Carpella* 4, quorum 1 vel 2 tantum maturantia, dense pilosa, ovulis 5–6 uniseriatis. *Fructus* haud semper torulosus, 1–2 cm. longus, 1·3 cm. diametro, stipite 5 mm. longo, tomentellus.

Chiengmai, mixed jungle at foot of Doi Sootep, 330 m., *Kerr*, 1207.

According to Kerr the fruit is edible.

Lao name, Noom Wooa.

The systematic position of this plant is a little doubtful. It agrees with *Unona* in everything but the carpels and would appear to be intermediate between that genus with its many carpels and *Monocarpia* with its solitary carpel.

**Unona dumosa**, *Roxb.*—F.B.I., i. p. 59 ; Fl. Indo-Chine, i. p. 60.

Near Chantaboon, *Murton*, 82.

*Distr.* Assam.

**Goniothalamus Griffithii**, *Hook. f. et Th.* —F.B.I., i. p. 73 ; For. Fl. Burma, i. p. 42.

Chiengmai, by streams on Doi Sootep, 660 m., *Kerr*, 1209.

*Distr.* Burma.

**Mitrephora Maingayi**, *Hook. f. et Th.*, var. **Kurzii**, *King*. *M. vandaeflora*, Kurz, For. Fl. Burma, i. p. 65.

Doi Saket, Ban Sun Pak Suk, 600 m., *Kerr*, 1024.

*Distr.* Pegu.

**Anomianthus heterocarpus**, *Zoll.*—Fl. Indo-Chine, i. p. 46.

Chiengmai, common, 300 m., *Kerr*, 607.

*Distr.* Indo-China, Java.

**Miliusa velutina**, *Hook. f. et Th.*—F.B.I., i. p. 87 ; For. Fl. Burma, i. p. 47 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 17 ; Fl. Indo-Chine, i. p. 112.

Chiengmai, Doi Sootep, 300 m., *Kerr*, 1078.

*Distr.* India, Burma, Cochinchina.

**Miliusa** sp. n. aff. *M. Thorelii*, Finet et Gagnep.

Small dioecious tree—♂ only known, collected by Kerr (1162) on Doi Sootep.

**Orophea polycephala**, *Pierre*—Fl. Indo-Chine, i. p. 119.

Muong-pran (ex Fl. Indo-Chine l.c.).

## Menispermaceae.

**Tinospora crispa**, *Miers*—F.B.I., i. p. 96; For. Fl. Burma, i. p. 52; Fl. Indo-Chine, i. p. 132.
Ratpura Province (ex Fl. Indo-Chine l.c.).

**Limacia velutina**, *Miers*—F.B.I., i. p. 100; For. Fl. Burma i. p. 55; Fl. Indo-Chine, i. p. 144.
Near Muong-pran (ex Fl. Indo-Chine, l.c.).

**Limacia triandra**, *Miers*—F.B.I., i. p. 100; For. Fl. Burma, i. p. 55; Fl. Indo-Chine, i. p. 146.
Petchabouri River (ex Fl. Indo-Chine, l.c.).

**Cocculus villosus**, *DC.*—F.B.I., i. p. 101; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 17; Fl. Indo-Chine, i. p. 143.
Near Muong-pran (ex Fl. Indo-Chine, l.c.).

**Stephania hernandifolia**, *Walp.*—F.B.I., i. p. 103; Fl. Indo-Chine, i. p. 147.
Chiengmai, Doi Sootep, 720 m., *Kerr*, 748.
*Distr.* Asia, Africa, Australia.

**Stephania rotunda**, *Lour.*—F.B.I., i. p. 103; Fl. Indo-Chine, i. p. 148.
Chiengmai, annual shoots from a large, round, perennial, woody tuber, usually lying on rocks, in evergreen jungle on Doi Sootep, 750 m., *Kerr*, 641.
*Distr.* India, China, Indo-China, Malaya.

**Cissampelos Pareira**, *Linn.*—F.B.I., i. p. 104; Fl. Indo-Chine, i. p. 149.
Petchabouri River (ex Fl. Indo-Chine, l.c.).

**Pachygone dasycarpa**, *Kurz*—For. Fl. Burma, i. p. 56; Fl. Indo-Chine, i. p. 152.
Siam (ex Fl. Indo-Chine, l.c.).

**Pachygone nitida**, *Pierre ex Gagnep.*—Fl. Indo-Chine, i. p. 153.
Som-reap, (ex Fl. Indo-Chine, l.c.).

**Antitaxis nodiflora**, *Gagnep.*—Fl. Indo-Chine, i. p. 154.
Muong-pran, Wai Wan (ex Fl. Indo-Chine, l.c.).

## Berberidaceae.

**Mahonia nepalensis**, *DC.* *Berberis nepalensis*, Spreng.—F.B.I., i. p. 109; For. Fl. Burma, i. p. 58; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 17.
Chiengmai, Doi Sootep, 1500–1650 m., *Kerr*, 1107.
*Distr.* India, Burma, China, Philippines.

## Capparidaceae.

**Gynandropsis pentaphylla**, *DC.*—F.B.I., i. p. 171; Fl. Indo-Chine, i. p. 175.
Bangkok, *Zimmermann*, 4.
*Distr.* Common in Tropics.

**Niebuhria decandra**, *Gagnep.*, var. **angustifolia**, *Gagnep.*, Fl. Indo-Chine, i. p. 176.

Muong-pran, (ex Fl. Indo-Chine, l.c.).

**Niebuhria siamensis**, *Kurz*, For. Fl. Burma, i. p. 59 ; Fl. Indo-Chine, i. p. 177.
Ratbouri Province, (ex Fl. Indo-Chine, l.c.).

**Capparis echinocarpa**, *Pierre ex Gagnep.*—Fl. Indo-Chine, i. p. 195.
Petchabouri, *Pierre*, 4016.

**Capparis flavicans**, *Wall.*—F.B.I. i. p. 179 ; For. Fl. Burma, i. p. 63 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 19. *C. cambodiana*, Pierre ex Gagnep.—Fl. Indo-Chine, i. p. 194.
Lakon, 300 m., *Kerr*, 1010 ; Ratbouri, *Teysmann* ; Paknampo, *Witt.*
*Distr.* Burma.

**Capparis foetida**, *Blume*—Fl. Indo-Chine, i. p. 184.
Paknampo, *Witt*, 6.
*Distr.* Cochinchina.

**Capparis horrida**, *Linn. f.*—F.B.I., i. p. 178 ; For. Fl. Burma, i. p. 62 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 21 ; Fl. Indo-Chine, i. p. 185.
Meh Ngat, 420 m., *Kerr*, 1035.
*Distr.* India, Burma, Malaya, Philippines.

**Capparis micrantha**, *DC.*—F.B.I., i. p. 179 ; For. Fl. Burma, i. p. 61 ; Fl. Indo-Chine, i. p. 186. ? *C. roydsiaefolia*, Kurz, For. Fl. Burma, i. p. 61. *C. sp.*, Williams, Bull. Herb. Boiss. v. (1905) p. 24. p.p.
Paknampo, *Witt* 3, 4 ; Bangkok, *Zimmermann*, 63, *Schomburgk*, 107.
*Distr.* Burma, Malaya, Philippines.

**Capparis sepiaria**, *Linn.*—F.B.I., i. p. 177 ; For. Fl. Burma, i. p. 66 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 21 : Fl. Indo-Chine, i. p. 191.
Chiengmai, mixed jungle at foot of Doi Sootep, 300 m., *Kerr*, 609.
*Distr.* India, Malaya, Philippines.

**Capparis siamensis**, *Kurz*, For. Fl. Burma, i. p. 63 ; Williams, Bull. Herb. Boiss., v. (1905) p. 24 ; Fl. Indo-Chine, i. p. 195.
Ratbouri, *Teysmann*, 5927 in Hb. Kurz ; Paknampo, *Witt*, 1.

**Capparis tenera**, *Dalz.*, var. **latifolia**, *Hook. f. et Th.*, F.B.I., i. p. 179. *C. disticha*, Kurz, Journ. As. Soc. Beng., xliii. p. 69.
Chiengmai, scandent among bamboo clumps on banks of Meh Ping, 300 m., *Kerr*, 606.
*Distr.* Pegu, Rangoon.

**Capparis Thorelii**, *Gagnep.*, var. **pranensis**, *Gagnep.*—Fl. Indo-Chine, i. p. 190.
Muong-pran, *Pierre*, 4018.

**Crataeva Narvala**, *Ham.* *C. religiosa*, Forst., var. *Nurvala*, Hook. f. et Th., F.B.I., i. p. 172. *C. religiosa*, Forst., var. *Narvala*, Fl. Indo-Chine, i. p. 178.
Phre, Hooey Kamin, 180 m., *Kerr*, 989.
*Distr.* India, Indo-China, Malaya.
Lao name, Mai Fuk Koom (ex *Kerr*).

## Violaceae.

**Viola serpens**, *Wall.*—F.B.I., i. p. 184 ; Coll. et. Hemsl., Journ. Linn. Soc., xxviii. p. 22.

Chiengmai, Doi Sootep, 1200–1500 m., *Kerr*, 518, 518a ; 1700 m., *Hosseus*, 190.

*Distr.* India, China, Burma, Java.

***Alsodeia Murtonii**, *Craib*, Kew Bull. 1910 p. 275. *A. macrophylla*, Williams, Bull. Herb. Boiss., v. (1905) p. 24. p.p. ; Fl. Indo-Chine i. p. 217, p.p. *non* Decne.

Koh Klone, *Murton*, 15.

**Alsodeia sp.**, *Craib*, Kew Bull. 1910 p. 275 in nota. *A. macrophylla*, Williams, Bull. Herb. Boiss. v. (1905) p. 275, p.p. ; Fl. Indo-Chine, i. p. 217, p.p. *non* Decne.

Chantaboon, *Murton*, 72.

Closely related to *A. membranacea*, King, a native of Perak.

**Scyphellandra Pierrei**, *H. de Boissieu*—Fl. Indo-Chine, i. p. 218, cum tab.

Near Chantaboon, *Murton*, 84 ; Doi Chieng Dao, 420 m., *Hosseus*, 465.

*Distr.* Cochinchina.

## Bixaceae.

**Flacourtia Thorelii**, *Gagnep.*—Fl. Indo-Chine, i. p. 236, var. ?

Chiengmai, Doi Sootep, 600–900 m., *Kerr*, 562 (♂) ; Ban Meh Tah, 450 m., *Kerr*, 562a (♀).

*Distr.* Nong-kay.

This species is represented in Herb. Kew by female specimens only. Kerr's 562a agrees with these, but 562 differs from the description in having the filaments glabrous.

**Taraktogenos serrata**, *Pierre ex Gagnep.*—Fl. Indo-Chine, i. p. 225.

Muong-pran (ex Fl. Indo-Chine l.c.).

## Polygalaceae.

**Salomonia cantoniensis**, *Lour.*—F.B.I., i. p. 206 ; Fl. Indo-Chine, i. p. 250.

Chiengmai, Doi Sootep, 360 m., *Kerr*, 1335.

*Distr.* S.E. Asia.

**Salomonia longiciliata**, *Kurz*—Fl. Indo-Chine, i. p. 251, cum tab.

Wang Djao, *Hosseus*, 121.

*Distr.* Pegu.

**Polygala longifolia**, *Poir.*—Chodat, Monog. Polygal., ii. p. 358 ; Fl. Indo-Chine, i. p. 257. *P. leptalea*, DC.—F.B.I., i. p. 202, p.p. ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 22.

Chiengmai, in eng jungle on Doi Sootep, 300–600 m., *Kerr*, 755.

*Distr.* India, Burma, N.E. Australia.

**Polygala persicariaefolia**, *DC.*—F.B.I., i. p. 202.

Chiengmai, among grass on Doi Sootep, 1500 m., *Kerr*, 887.

*Distr.* India, Burma, Assam, Yunnan, Trop. Africa.

**Polygala tricholopha**, *Chodat*, Monog. Polygal., ii. p. 98. *P. arillata*, Ham.—F.B.I., i. p. 200, p.p.

Chiengmai, scandent in evergreen jungle on Doi Sootep, 900 m., *Kerr*, 700.

*Distr.* Nepaul, Khasia.

**Polygala triphylla**, *Ham.*, var. **glaucescens**, *A. W. Benn.*, F.B.I., i. p. 201 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 23.

Chiengmai, among grass on Doi Sootep, 1500 m., *Kerr* 777, 886 ; Wang Djao, *Hosseus*, 55.

*Distr.* India, China, Burma, Malay Peninsula.

*P. cardiocarpa*, Kurz, which is not represented in Herb. Kew must be closely allied to this plant. According to Fl. Indo-Chine *P. cardiocarpa* does occur in Indo-China, whereas *P. glaucescens* is not mentioned in that Flora.

**Xanthophyllum flavescens**, *Roxb.*, var. **virens**, *A. W. Benn.*, F.B.I., i. p. 209. *X. virens*, Roxb.—For. Fl. Burma, i. p. 81.

Muang Prow, Meh Ngat, 480 m., *Kerr*, 1038.

*Distr.* Burma, Assam.

## Caryophyllaceae.

**Brachystemma calycinum**, *Don*—F.B.I., i. p. 235 ; Fl. Indo-Chine, i. p. 265.

Doi Chieng Dao, 400 m., *Hosseus*, 470.

*Distr.* Nepaul to Yunnan.

**Polycarpaea corymbosa**, *Lamk.*—F.B.I., i. p. 245 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 24 ; Fl. Indo-Chine, i. p. 267.

Kan Phra Dang, *Hosseus*, 158.

*Distr.* India, China, Burma.

## Hypericaceae.

**Hypericum japonicum**, *Thunb.*—F.B.I., i. p. 256 ; For. Fl. Burma, i. p. 83 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 24 ; Fl. Indo-Chine, i. p. 286.

Chiengmai, on Doi Sootep, 700 m., *Hosseus*, 485.

*Distr.* India, Burma, China, Japan, Malaya, Australia, New Zealand.

**Cratoxylon polyanthum**, *Korth.*—F.B.I., i. p. 257 ; For. Fl, Burma, i. p. 84 ; Williams, Bull. Herb. Boiss., v. (1905) p. 25.

Chiengmai, Doi Sootep, 390 m., *Kerr*, 1080.

*Distr.* Throughout Indo-China, China, Malaya, Philippines.

**Cratoxylon prunifolium**, *Dyer*, F.B.I., i. p. 258 ; Fl. Indo-Chine, i. p. 289. *C. pruniflorum*, Kurz, For. Fl. Burma, i. p. 84.

Chiengmai, deciduous jungle on lower slopes of Doi Sootep, 300–600 m., *Kerr*, 611.

*Distr.* Burma, Yunnan, Cambodia.

## Guttiferae.

**Garcinia cornea**, *Linn.*—F.B.I., i. p. 260 ; For. Fl. Burma, i. p. 88.

Chiengmai, Doi Sootep, 660 m., *Kerr*, 1073 ♂ : Meh Kung, 420 m., *Kerr*, 1020 ♀.

*Distr.* India, Burma, Malaya.

**Garcinia Cowa**, *Roxb.*—F.B.I., i. p. 262 p.p.; For. Fl. Burma, i. p. 90.
Chiengmai, Doi Sootep, 900 m., *Kerr*, 1124.
*Distr.* Bengal, Burma, Assam, Yunnan.

**Garcinia merguensis**, *Wight*—F.B.I., i. p. 267; For. Fl. Burma, i. p. 89; Fl. Indo-Chine, i. p. 299.
Chiengmai, Doi Sootep, 600 m., *Kerr*, 1135 ♀, 1139 ♂.
*Distr.* Burma, Malacca, Cambodia.

**Garcinia Schomburgkiana**, *Pierre*—Fl. Indo-Chine, i. p. 312; *non* Williams, Bull. Herb. Boiss., v. (1905) p. 25.
Siam, *Schomburgk*, sine num.

**Garcinia Xanthochymus**. *Hook. f. ex T. And.*, F.B.I., i. p. 269; For. Fl. Burma, i. p. 93; Williams, Bull. Herb. Boiss., v. (1905) p. 25.
Chiengmai, Doi Sootep, 660 m., *Kerr*, 1201.
*Distr.* India (often cultivated).
Lao name, Mai Dah.

**Ochrocarpus siamensis**, *T. And.*, F.B.I., i. p. 270; For. Fl. Burma, i. p. 94; Fl. Indo-Chine, i. p. 293; Williams, Bull. Herb. Boiss., v. (1905) p. 25.
Chiengmai, on lower slopes of Doi Sootep, 300–450 m., *Kerr*, 548.
*Distr.* Burma, Cambodia, Cochinchina.
Lao name, Sălup Pi.

**Calophyllum Inophyllum**, *Linn.*—F.B.I., i. p. 273; For. Fl. Burma, i. p. 95; Fl. Indo-Chine, i. p. 324; Williams, Bull. Herb. Boiss. v. (1905) p. 25. *Garcinia Schomburgkiana*, Williams, Bull. Herb. Boiss., v. (1905) p. 25, *non* Pierre.
Bangkok, *Schomburgk*, 151.
*Distr.* India, Burma, China, Cochinchina, Malaya.

**Mesua ferrea**, *Linn.*—F.B.I., i. p. 277; For. Fl. Burma, i. p. 97; Fl. Indo-Chine, i. p. 328; Williams, Bull. Herb. Boiss., v. (1905) p. 25.
Chiengmai, cultivated, 300 m., *Kerr*, 1211; Bangkok, *Zimmermann*, 110.
*Distr.* Throughout India, Indo-China, Malaya—often cultivated.

## Ternstroemiaceae.

**Anneslea fragrans**, *Linn.*—F.B.I., i. p. 280; For. Fl. Burma, i. p. 98; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 25; Williams, Bull. Herb. Boiss., v. (1905) p. 25; Fl. Indo-Chine, i. p. 335.
Chiengmai, Doi Sootep, 1350–1650 m., *Kerr*, 509, *Hosseus*, 216.
*Distr.* Burma.

**Ternstroemia japonica**, *Thunb.*—F.B.I., i. p. 281; For. Fl. Burma, i. p. 99; Fl. Indo-Chine, i. p. 332.
Chiengmai, Doi Sootep, 1500 m., *Kerr*, 1307 (♀), 900 m., *Kerr*, 1257 (♂).
*Distr.* India, Burma, China, Japan, Cambodia, Cochinchina.

**Adinandra integerrima**, *T. And. ex Dyer*, F.B.I., i. p. 282; Fl. Indo-Chine, i. p. 334.
Chiengmai, Doi Sootep, 900 m., *Kerr*, 1156.
*Distr.* Yunnan, Cambodia, Malay Peninsula.

**Eurya acuminata**, *DC.*, var. **Wallichiana**, *Dyer*, F.B.I., i. p. 285.
Chiengmai, in evergreen jungle on Doi Sootep, 1350–1500 m., *Kerr*, 875.
*Distr.* India, Burma, China, Malaya.

**Eurya japonica**, *Thunb.*, var. **nitida**, *Dyer*, F.B.I., i. p. 284 ; Fl. Indo-Chine, i. p. 338.
Chiengmai, Doi Sootep, 1500–1700 m., *Kerr*, 510, *Hosseus*, 181, 183.
*Distr.* India, Cochinchina, Tonkin, Cambodia, Malay Archipelago.

**Saurauja Roxburghii**, *Wall.*—F.B.I., i. p. 287 ; For. Fl. Burma, i. p. 103 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 25 ; Fl. Indo-Chine, i. p. 26.
Chiengmai, in evergreen jungle on Doi Sootep, 900 m., *Kerr*, 686.
*Distr.* E. India.

**Schima Wallichii**, *Chois.*—F.B.I., i. p. 289 ; For. Fl. Burma, i. p. 106 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 25 ; Fl. Indo-Chine, i. p. 350.
Chiengmai, Doi Sootep, 660–1350 m., *Kerr*, 1083.
*Distr.* India, Burma, Yunnan.

Lao name, Měh Tăh Loh.

**Pyrenaria camelliæflora**, *Kurz*, var. ?
Chiengmai, Doi Sootep, 1350–1650 m., *Kerr*, 1102.
Differs from *P. camelliæflora*, chiefly in the slightly larger flowers.

**Camellia drupifera**, *Lour.*—F.B.I., i. p. 293 ; For. Fl. Burma, i. p. 109.
Chiengmai, Doi Sootep, 1200–1700 m., *Kerr*, 889, *Hosseus*, 180.
*Distr.* India, Burma, China.

## Dipterocarpaceae.

**Dipterocarpus alatus**, *Roxb.*—F.B.I., i. p. 298, excl. syn. *D. costatus*; For. Fl. Burma, i. p. 116 ; Brandis, Journ. Linn. Soc., xxxi. p. 34 ; Fl. Indo-Chine, i. p. 362 ; Williams, Bull. Herb. Boiss., v. (1905) p. 26.
Chiengmai plain, 300 m., *Kerr*, 532.
*Distr.* Burma.

**Dipterocarpus costatus**, *Gaertn.*—For. Fl. Burma, i. p. 117 ; Brandis, Journ. Linn. Soc., xxxi. p. 35. *D. alatus*, Dyer, F.B.I., i. p. 298 p. p.
Chiengmai, in evergreen jungle on Doi Sootep, 600–(? 1500) m., *Kerr*, 1067.
A portion of Kerr's 1067 was sent to Calcutta Herbarium, and was compared with the material there by Mr. W. W. Smith, who remarks that it agrees well with the Burmese specimens referred to *D. costatus* by the late Sir George King. Through lack of material, Dyer, in the Flora of British India, l.c., reduced this species to *D. alatus*, and Brandis, for the same reason, while enumerating it as a distinct species, seems to indicate that it is not

a very satisfactory species. The receipt of good material shows, however, that it is a well-marked species, and quite distinct from *D. alatus*.

*Distr.* Chittagong (*fide Smith in litt.*), Burma, *Robertson*, 118, *Brandis* in Herb. Kurz.

**Dipterocarpus intricatus**, *Dyer*—Brandis, Journ. Linn. Soc., xxxi. p. 39 ; Fl. Indo-Chine, i. p. 360.

Korat, 60–90 m., *Witt.*

*Distr.* Cambodia, Cochinchina.

Vern. Mai Krat (ex *Witt*).

**Dipterocarpus obtusifolius**, *Teysm.*—F.B.I., i. p. 295; For. Fl. Burma, i. p. 115 ; Brandis, Journ. Linn. Soc., xxxi. p. 27 ; Fl. Indo-Chine, i. p. 358 ; Williams, Bull. Herb. Boiss., v. (1905) p. 26.

Chiengmai, Doi Sootep, 300–900 m., *Kerr*, 931, *Hosseus*, 298 ; *Teysmann*, 5918 Herb. Bog. sine loc.

*Distr.* Burma.

Lao name, Mai Hieng (ex *Kerr*).

**Dipterocarpus tuberculatus**, *Roxb.*—F.B.I., i. p. 297 ; For. Fl. Burma, i. p. 113 ; Brandis, Journ. Linn. Soc., xxxi. p. 32 ; Fl. Indo-Chine, i. p. 361 ; Williams, Bull. Herb. Boiss., v. (1905) p. 26.

Chiengmai, on lower slopes of Doi Sootep, 300–450 m., *Kerr*, 1066 ; Korat, 60–90 m., *Witt* ; *Teysmann*, 5932 in Herb. Bog. sine loc.

*Distr.* Burma, Cochinchina.

Lao name, Mai Tüng (ex *Kerr*).

**Dipterocarpus turbinatus**, *Gaertn.*—F.B.I., i. p. 295 e. p. ; Brandis, Journ. Linn. Soc., xxxi. p. 27. *D. laevis*, Ham.—For. Fl. Burma, i. p. 114.

Chiengmai, Doi Sootep, 600 m., *Kerr*, 1152.

*Distr.* Assam, Burma, Malacca.

**Shorea floribunda**, *Kurz*—F.B.I., i. p. 304 ; For. Fl. Burma, i. p. 119 ; Brandis, Journ. Linn. Soc., xxxi. p. 85.

Chiengmai, Doi Sootep, 300–800 m., *Kerr*, 527, 567, *Hosseus*, 427.

*Distr.* Burma.

Lao name, Kun Gaum (ex *Kerr*).

**Shorea obtusa**, *Wall.*—F.B.I., i. p. 306 ; For. Fl. Burma, i. p. 118 ; Brandis, Journ. Linn. Soc., xxxi. p. 80 ; Fl. Indo-Chine, i. p. 378.

Chiengmai, lower slopes of Doi Sootep, 300–600 m., *Kerr*, 549.

*Distr.* Throughout Indo-China, East India.

Lao name, Mai Ngaa.

**Hopea odorata**, *Roxb.*—F.B.I., i. p. 308 ; For. Fl. Burma, i. p. 120 ; Brandis, Journ. Linn. Soc., xxxi. p. 59 ; Fl. Indo-Chine, i. p. 373.

Chiengmai, Doi Sootep, 300–750 m., *Kerr*, 1099 ; Muang Win, 420–450 m., *Nisbet*, 1069 in Herb. Kerr ; Bangkok, *Zimmermann*, 103 ; Lem Tong Lan, *Murton*, 121.

*Distr.* General in Indo-China, Andaman Is., Borneo.

Lao name, Mai Takien (ex *Kerr*).

Murton, 121 is referable to var. *eglandulosa*, Pierre.

**Pentacme siamensis**, *Kurz*, For. Fl. Burma, i. p. 119 ; Fl. Indo-Chine, i. p. 385. *Shorea siamensis*, Miq.—F.B.I., i. p. 304 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 25.

Var. β **suavis**, *Pierre*—Fl. Indo-Chine, l.c.
Chiengmai, Doi Sootep, 300–750 m., *Kerr*, 556 e.p.
Var. γ **mekongensis**, *Pierre*—Fl. Indo-Chine, l.c.
Chiengmai, Doi Sootep, 400–800 m., *Kerr*, 556 e.p., *Hosseus*, 477.
*Distr.* Burma.
Lao name, Mai Pow.
From Dr. Kerr's notes it appears that there is a glabrous and a pubescent form of *Dipterocarpus tuberculatus* and of *D. obtusifolius* as well as of *Pentacme siamensis*. These two forms of each of the three species are recognised by the natives as distinct, *e.g.*, the glabrous and pubescent forms of *D. tuberculatus* are known to them as the red and the white Mai Tüng. Dr. Kerr has so far been unable to collect a complete set of specimens showing these various forms owing to the scarcity of some of them near Chiengmai, *e.g.*, the glabrous form of *D. tuberculatus* is the common form on Doi Sootep where the pubescent form is rather rare.

## Malvaceae.

**Wissadula zeylanica**, *Medik.*—Fl. Indo-Chine, i. p. 410. *W. rostrata*, Planch.—F.B.I., i. p. 325.
Lakon, 300 m., *Kerr*, 1012 ; Menam, *Hosseus*, 716a.
*Distr.* Tropics.

**Sida mysorensis**, *W. & A.*—F.B.I., i. p. 322 ; Fl. Indo-Chine, i. p. 403.
Chiengmai, Doi Sootep, 660 m., *Kerr*, 959.
*Distr.* India, Java, throughout Indo-China.

**Abutilon indicum**, *G. Don*—F.B.I., i. p. 326 ; Fl. Indo-Chine, i. p. 409.
Bangkok, *Schomburgk*, 208, *Zimmermann*, 165.
*Distr.* Tropics.

**Malachra capitata**, *Linn.*—F.B.I., i. p. 329 ; Fl. Indo-Chine, i. p. 411.
Bangkok, *Zimmermann*, 32.
*Distr.* Tropics.

**Urena lobata**, *Linn.*, var. **sinuata** (*Linn.*)—Fl. Indo-Chine, i. p. 414. *U. sinuata*, Linn.—F.B.I., i. p. 329.
Bangkok, *Zimmermann*, 22.
*Distr.* Tropics.

**Urena repanda**, *Roxb.*—F.B.I., i. p. 330 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 26 ; Fl. Indo-Chine, i. p. 416.
Chiengmai, Doi Sootep, 500 m., *Hosseus*, 278 ; Raheng, *Lindhard*, 64 ; Siam (?), *Candler*.
*Distr.* India, Burma, China.

**Urena rigida**, *Wall.*—F.B.I., i. p. 330 ; Fl. Indo-Chine, i. p. 414.
Siam (?), *Candler*.
*Distr.* India, Malacca, Borneo.

**Malvaviscus arboreus**, *Cavan.*—Fl. Indo-Chine, i. p. 412.
Bangkok, *Zimmermann*, 51.
*Distr.* Native of Trop. America and W. Indies, often cultivated in Tropics.

Decaschistia parviflora, *Kurz*, Journ. As. Soc. Beng., xxxix. p. 66. *D. Thorelii*, Pierre—Fl. Indo-Chine, i. p. 420.
Kanburi, *Teysmann*, in herb. Kurz ; Petchabouri, *Pierre*, 3922.
*Distr.* Cambodia.

Hibiscus Abelmoschus, *Linn.*—F.B.I., i. p. 342 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 26 ; Fl. Indo-Chine, i. p. 434. *H. cancellatus*, Williams, Bull. Herb. Boiss., v. (1905) p. 28, *non* Roxb.
Bangkok, *Schomburgk*, 310, *Zimmermann*, 148.
*Distr.* India ; generally cultivated in the Tropics.

Hibiscus cancellatus, *Roxb.*—F.B.I., i. p. 342, p.p. ; Fl. Indo-Chine, i. p. 435 ; *non* Williams, Bull. Herb. Boiss., v. (1905) p. 28.
Chiengmai, mixed jungle at foot of Doi Sootep, 300 m., *Kerr*, 764.
*Distr.* India, Yunnan.

*Hibiscus glanduliferus, *Craib*, Kew Bull. 1910 p. 275.
Chiengmai, *Kerr*, 778.

Hibiscus Rosa-sinensis, *Linn.*—F.B.I., i. p. 344 ; For. Fl. Burma, i. p. 125 ; Fl. Indo-Chine, i. p. 429.
Bangkok, *Zimmermann*, 43, 79.
*Distr.* Tropics—often cultivated.

Hibiscus sagittifolius, *Kurz*—? Fl. Indo-Chine, i. p. 434.
Chiengmai, in open grassy spots on Doi Sootep, 450 m., *Kerr*, 638.
*Distr.* Burma, Cambodia, Cochinchina.
There is in Herb. Kew no authentically named material of *H. sagittifolius* but specimens sent to Kew lately from Maymyo which seem to fit Kurz's original description do not agree with specimens received from Paris under that name. Kerr's plant quoted above approaches var. *septentrionale*, Gagnep., Fl. Indo-Chine, l.c.

Hibiscus schizopetalus, *Hook. f.*—Fl. Indo-Chine, i. p. 432.
Bangkok, *Zimmermann*, 33.
*Distr.* Mozambique.

Hibiscus Solandra, *L'Herit.*—F.B.I., i. p. 336.
Ban Toong Cha, foot of Meh Ping Rapids, 120 m., *Kerr*, 906.
*Distr.* Trop. Africa, Afghanistan, India, Burma.

Hibiscus subnudus, *Craib*, sp. n., radice floribusque *H. sagittifolio*, Kurz, similis sed caulibus sub anthesin fere nudis, indumento diverso, involucri bracteis brevioribus differt.
*Herba* 15–31 cm. alta ; radix perennis, crassa, fusiformis vel napiformis ad 10 cm. longa, 6 cm. diametro ; caules annui, 2·5–4·5 mm. diametro, juventute erecti, anni praeteriti prostrati, primo pilis brevibus rigidiusculis reflexis dense obtecti et praeterea pilis longiusculis deciduis parce instructi. *Folia* cordato-reniformia vel sagittata, apice obtusa, 1·5–2 cm. longa, 1·2–1·7 cm. lata, rigide chartacea, crenata, utrinque pilis albis nitidis longiusculis rigidiusculis deciduis instructa, nervis e basi 5 utrinque conspicuis ; petioli 8–13 mm. longi, indumento ut in foliis ; stipulae parvae deciduae. *Pedunculi* axillares, uniflori raro furcati, 6·5–10 cm longi, indumento

ut in caulibus. *Involucri* bracteae 7, e basi liberae, lineari-lanceolatae, obtusae, 1 cm. longae, 1·5 mm. latae, indumento brevi ut in caulibus et praeterea pilis longis sparse ciliatae. *Calyx* spathaceus vel in segmenta dua irregulariter fissus, involucrum paulo superans, puberulus. *Corolla* longe exserta, 5–6 cm. longa, 6–6·5 cm. diametro, sulphurea nisi oculo coccineo ; petala late obovata vel subrhomboidea, 4·7 cm. lata, glabra, ungui brevi. *Filamenta* in columnam 1·5 cm. altam connata. *Styli* rami 5, subconnati, stigmatibus spathulatis breviter pilosi. *Fructus* vix maturus, late ellipsoideus, 1·6 cm. altus, 1 cm. diametro, parce albo-hirsutus.

Near Meh Mău, 300 m., in deciduous jungle, *Kerr*, 1004.
Lao name, Chi Chau.

**Hibiscus surattensis**, *Linn.*—F.B.I., i. p. 334.
Doi Chieng Dao, 400 m., *Hosseus*, 468 ; Raheng, *Lindhard*, 65.
*Distr.* Trop. Asia, Australia, Africa.

**Hibiscus vitifolius**, *Linn.*—F.B.I., i. p. 338.
Chiengmai, 300 m., *Kerr*, 800.
*Distr.* Tropics—often cultivated.

**Thespesia Lampas**, *Dalz. et Gibs.*—F.B.I., i. p. 345 : For. Fl. Burma, i. p. 128 ; Fl. Indo-Chine, i. p. 437.
Chiengmai, Doi Sootep, 300–720 m., *Kerr*, 795 ; Wang Djao, *Hosseus*, 54.
*Distr.* India, Burma, China, Cochinchina, Malaya, Africa.

**Gossypium arboreum**, *Linn.*—F.B.I., i. p. 347 ; Fl. Indo-Chine, i. p. 441.
Bangkok, *Zimmermann*, 131.
Sir G. Watt remarks on this plant that it is a "form approaching *G. Nanking*, Meyen."

## Sterculiaceae.

**Sterculia campanulata**, *Wall.?*
Hills between Muang Prow and Chieng Dao, 600 m., *Kerr*, 1043.
The identification is not quite certain as the collection consists of a few male flowers.

**Sterculia ornata**, *Wall.*—For. Fl. Burma, i. p. 136 ; Fl. Indo-Chine, i. p. 466. *S. armata*, Mast., F.B.I., i. p. 367, p.p.
Doi Chieng Dao, 1700 m., *Hosseus*, 411.
*Distr.* Burma.

**Sterculia pexa**, *Pierre*—Fl. Indo-Chine, i. p. 462.
Bangkok, *Zimmermann*, 48.
*Distr.* Cochinchina.

**Sterculia lanceolata**, *Cav.*
Chiengmai, Doi Sootep, 660 m., *Kerr*, 1088.
*Distr.* China.

**Helicteres angustifolia**, *Linn.*—F.B.I., i. p. 365, p.p. ; Fl. Indo-Chine, i. p. 495.
Wang Djao, *Hosseus*, 70a.
*Distr.* India, China, Malaya.

**Helicteres elongata**, *Wall.*—F.B.I., i. p. 365 ; For. Fl. Burma, i. p. 144 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 27.

Raheng, 120 m., *Kerr*, 902 ; Wang Djao, *Hosseus*, 60.
*Distr.* E. India, Burma.

**Helicteres glabriuscula**, *Wall.*—F.B.I., i. p. 366 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 26.
Chiengmai, in scrub jungle at foot of Doi Sootep, 300 m., *Kerr*, 630.
*Distr.* Burma.

**Helicteres lanceolata**, *DC.*—For. Fl. Burma, i. p. 142 ; Williams, Bull. Herb. Boiss., v. (1905) p. 29 ; Fl. Indo-Chine, i. p. 493. *H. angustifolia*, F.B.I., i. p. 365, p.p.
Wang Djao, *Hosseus*, 70.
*Distr.* Burma, Cochinchina, Java.

**Helicteres plebeja**, *Kurz*—F.B.I., i. p. 366 ; For. Fl. Burma, i. p. 144 ; Fl. Indo-Chine, i. p. 491.
Chiengmai, deciduous jungle on Doi Sootep, 720 m., *Kerr*, 630a.
*Distr.* Burma, Tonkin.
Very closely allied to, if not identical with, *H. elongata*.

**Pterospermum semisagittatum**, *Ham.*—F.B.I., i. p. 368 ; For. Fl. Burma, i. p. 146 ; Fl. Indo-Chine, i. p. 502.
Chiengmai, Doi Sootep, 330 m., *Kerr*, 1186.
*Distr.* Burma, Chittagong, Cambodia, S. India (cultivated ?)—often cultivated in tropics.

**Eriolaena Candollei**, *Wall.*—F.B.I., i. p. 370 ; For. Fl. Burma, i. p. 148 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 27 ; Fl. Indo-Chine, i. p. 506.
Raheng, on banks of Meh Ping, 120 m., *Kerr*, 899.
*Distr.* Burma.

**Melochia corchorifolia**, *Linn.*—F.B.I., i. p. 374 ; Fl. Indo-Chine, i. p. 509.
Chiengmai, bank of Meh Ping, 300 m., *Kerr*, 852.
*Distr.* Cosmopolitan in Tropics.

## Tiliaceae.

**Grewia aspera**, *Roxb.* vel species arcte affinis. *G. abutilifolia*, Masters, F.B.I., i. p. 390 ; Williams, Bull. Herb. Boiss., v. (1905) p. 29, an Juss. ?
Chiengmai, in deciduous jungle on Doi Sootep, 300–720 m., *Kerr*, 631.
*Distr.* India, Burma, Cambodia, Malaya.

**Grewia humilis**, *Wall.*—F.B.I., i. p. 390. *G. asiatica*, Linn., var. *vestita*, Gagnep., Fl. Indo-Chine, i. p. 537, non *G. vestita*, Wall.
Bangkok, *Zimmermann*, 122.
*Distr.* Burma.

**Grewia Lacei**, *Drummond et Craib*, sp. n., e grege *G. tomentosae*, Juss., a qua foliorum paginae superioris indumento et venatione necnon marginum denticulis multo obscurioribus nec duplo-serratis bene cognoscitur ; a *G. hirsuta*, Vahl, atque ejusdem affinioribus, indumento diverso, foliis multo longioribus, et pedunculis pedicellisque multo brevioribus facile distinguenda.
*Arbuscula* sarmentosa, circiter 1·5 m. alta (*ex Kerr*) ; rami virgati, ligno albo nitido, cortice fusco libero in fibras satis longas

tenaciores demum soluto obtecti, juventi indumento densius intertexto primo argenteo mox ferruginescente vestiti. *Folia* anguste oblongo-lanceolata, basi leviter obliqua, ad apicem obtusum vel acutum nonnunquam vere cuspidatum, costa autem vix excurrente, sensim angustata, 18 cm. vel plus longitudinis, 4·2 cm. latitudinis attingentia, petiolo vix 5 mm. longo hirsutissimo rufescente suffulta, versus basin quasi tricostata, nervis lateralibus ad decem paria, angulo satis acuto a costa exorientibus, leniter arcuatis in pagina superiore leviter impressis laxe hirsutis, in inferiore densius pilosis, versus basin prominentibus at superne prope evanidis, nervis transversis e primariis squarrose exorientibus varie curvatis nonnunquam ramificatis 2–3 mm. inter se remotis in pagina superiore venis lepide reticulatis sub oculo armato evidentibus connexis in inferiore propter tomentum omnino occultis, margine plus minusve at semper minute saepius irregulariter aliquando obscurissime denticulata, denticulis haud rariter pilorum quasi crista ornatis, subtus tomento aequo mollissimo dense coacto primum argenteo demum rufescente munita, supra pilis rarioribus subpellucidis singulis rarius bifurcatis at nunquam stellatis conspersa. *Inflorescentia* axillaris, polygamo-monoecia, e fasciculis duobus vel pluribus prope sessilibus, bracteolis singulis hirsutis inconspicuis instructis, constituta ; bractea circiter 4–6 mm. longa, ad basin deltoideam 1·5 mm. lata, superne in meram setam abeuns, valde pilosa ; pedicelli 2–5 mm. longi. *Sepala* oblongo-linearia, circiter 6 mm. longa, versus basin circiter 1·5 mm. lata, marginibus alte involuta, superne usque ad apicem cucullatum et obscure mucronatum pedetentim angustata, interne aurantiaco-brunnea, externe tomento robusto fulvo nitido hirsuta. *Petala* floris ♂ circiter 1·5 mm. longa, 1 mm. lata, parum incrassata, dorso pilis fulvis hirsuta, nectario mellis colore oculo pallidiore pilorum similium annulo circumdato infra unguem 0·5 mm. attingente, ungui flavescente vix 0·5 mm. longo 1 mm. lato apice praemorso. *Androgynophorii* columna circa 1 mm. longa, 0·5 mm. diametro, plus minusve compressa, subpurpurascens ; clavulus ovarium includens, iisdem pilis fulvis dense indutus ; stamina circa 20 vel pauciora, filamentis circiter 2 mm. longis. *Drupa* ex quattuor pyrenis plus minus per paria accretis, constans, depressa, subquadrata, pilis longiusculis albidis 2–5 in tuberculis badii coloris junctim insidentibus instructa, juventa fusca, maturior subflava, glabrescens.

Burma, Maymyo Plateau, 1050 m., *Lace*, 3223.

Chiengmai, in deciduous jungle on Doi Sootep, 720 m., *Kerr*, 677.

To this species probably belongs a plant collected in Laos by *Spire* (No. 547), but the material of the collection in Herb. Kew is too insufficient for a definite decision.

**Grewia Microcos**, *Linn.*—F.B.I., i. p. 392.

Chiengmai plain, on waste ground, 300 m., *Kerr*, 613.

*Distr.* India, Burma, Assam, China, Malaya.

Allied to *G. Microcos* is a specimen collected by the Siam Forest Officers (No. 170) which may probably be *G. ulmifolia*, Roxb.

**Grewia tomentosa**, *Juss.*

Banks of Meh Ping near Raheng, 120 m., *Kerr*, 903 ; Wang Djao, *Hosseus*, 69.

**Grewia trichodes**, *Voigt.* *G. pilosa*, Roxb., *non* Lamarck.
Chiengmai, 300 m., *Kerr*, 1249.

In identifying the plants belonging to this critical genus I have availed myself of the able assistance of Mr. J. R. Drummond who has spent much time in the study of this group. The present state of our knowledge of the Indo-Chinese species and the complicated synonymy of the Indian species have forbidden the giving as full references to published works as have been given throughout the rest of this paper.

**Columbia floribunda**, *Wall.*—F.B.I., i. p. 393 ; For. Fl. Burma, i. p. 156 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 28 ; Fl. Indo-Chine, i. p. 549.
Chiengmai, Doi Sootep, 660 m., *Kerr*, 1325.
*Distr.* Burma, Assam, Yunnan.

**Columbia flagrocarpa**, *C. B. Clarke ex Brandis*, var. **siamica**, *Craib*, var. nov., a typa ramulis paniculisque pilis longis haud vel parcissime instructis, petiolis tenuioribus paulo longioribus, foliis basi vix tam obliquis, fructusque umbonis pilis minus rigidis.
Chiengmai, mixed jungle on Doi Sootep, 450–540 m., *Kerr*, 895, 895a.

At first sight the variety is markedly different from the type in the total or almost total suppression of the rather long stiffish hairs on the branchlets and panicles. The type is represented by Clarke's fruiting Chittagong specimens only and the fruit except for the rather stiffer hairs on the umbo is very similar to that of the Siam plant.

**Triumfetta procumbens**, *Williams*, Bull. Herb. Boiss., v. (1905) p. 28, *non* Forst. f.

The sheet quoted by Williams l.c. contains specimens belonging to two distinct species and moreover both specimens were collected in the island of Phu Quoc in Cochinchina and not in Siam.

**Triumfetta pseudocana**, *Sprague et Craib*, nom. nov. *T. cana*, Lawson, F.B.I., i. p. 396, *non* Blume. *T. tomentosa*, Gagnep., Fl. Indo-Chine, i. p. 552, *vix* Bojer.
Chiengmai, Doi Sootep, 300–720 m., *Kerr*, 810.
*Distr.* India, China, Tonkin, Malaya, Philippines.

**Corchorus acutangulus**, *Lamk.*—F.B.I., i. p. 398 ; Fl. Indo-Chine, i. p. 558.
Chiengmai, among grass, 300m., *Kerr*, 855.
*Distr.* Tropics.

**Muntingia Calabura**, *Linn.*—Fl. Indo-Chine, i. p. 562.
Bangkok, *Zimmermann*, 6.
Introduced from Trop. America.

**Elaeocarpus floribundus**, *Blume*—F.B.I., i. p. 401 ; For Fl. Burma, i. p. 167.
Chiengmai, Doi Sootep, 720 m., *Kerr*, 689a.
*Distr.* N. India, Burma, Cambodia, Malaya.

**Elaeocarpus siamensis**, *Craib*, sp. n., ex affinitate *E. Wallichii*, Kurz, a quo petiolis tomentellis, foliis minoribus basi plerumque cuneatis facile distinguenda.

*Arbor* circiter 9 m. alta (*ex Kerr*), ramulis teretibus juventute dense puberulis mox fere glabris cortice rubro vel cinereo-rubro parce lenticellato obtectis. *Folia* lanceolata vel ovato-lanceolata, apice acuminata basi interdum inaequalia, cuneata vel obtusa, 7–14 cm. longa, 2·6–6 cm. lata, chartacea, supra costa tantum pubescente mox fere glabra, subtus costa nervisque praecipue molliter puberula, margine glanduloso-serrulata, nervis lateralibus utrinque 11–14 intra marginem arcuatis supra leviter impressis subtus prominentibus nervis transversis supra plerumque conspicuis subtus prominulis; petioli 1·8–2·7 cm. longi, juventute tomentelli, mox puberuli, supra apicem versus glandulis 2–3 instructi. *Racemi* ex axillis veteribus breviter pedunculati, circiter 15 cm. longi, rachi angulato puberulo; bracteae ante anthesin deciduae; pedicelli 6 mm. longi, breviter pubescentes. *Sepala* 5, lanceolata, obtusa, 4 mm. longa, 1·5 mm. lata, utrinque, intus parcius, imperfecte sericeo-pubescentia. *Petala* 5, alba, cuneata, fere 5 mm. longa, 4 mm. lata, fere ad medium fimbriata, parte integra ciliata intusque basem versus parce pubescentia. *Stamina* inclusa, filamentis brevibus; antherae breviter puberulae, apice pilis longiusculis parce instructae. *Disci* glandulae 5, pubescentes. *Ovarium* 3-loculare, pubescens; stylus deciduus, staminibus paulo brevior, apice glaber, basi ut in ovario pubescens. *Fructus* ignotus.

Chiengmai, evergreen jungle on Doi Sootep, 660 m., *Kerr*, 1200.

Lao name, Mai Moon.

## Linaceae.

**Erythroxylon burmanicum**, *Griff.*—F.B.I., i. p. 414; For. Fl. Burma, i. p. 171.

Chiengmai, Doi Sootep, 300–600 m., *Kerr*, 652.

*Distr.* Burma, Malaya.

Differs from typical *E. burmanicum*, in the leaves having generally fewer nerves and the reticulation being rather more prominent and open on the under surface.

## Malpighiaceae.

**Hiptage candicans**, *Hook. f.*, F.B.I., i. p. 419; For. Fl. Burma, i. p. 174; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 29.

Meh Taang, 360 m., *Kerr*, 1064.

*Distr.* Burma, Manipur, Yunnan.

**Hiptage Madablota**, *Gaertn.*—F.B.I., i. p. 418; For. Fl. Burma, i. p. 173.

Chiengmai, Doi Sootep, 720 m., *Kerr*, 563.

*Distr.* India, Burma, China, Malay Archipelago, Philippines.

## Zygophyllaceae.

**Tribulus terrestris**, *Linn.*—F.B.I., i. p. 423; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 29.

Raheng, 120 m., *Kerr*, 904.

*Distr.* Tropics.

## Geraniaceae.

**Impatiens Mengtszeana**, *Hook. f.*, Nuov. Arch. Mus. Hist. Nat. Par., Ser. iv. x. p. 256.

Chiengmai, Doi Sootep, 600–900 m., *Kerr*, 590.—det. Hook. f.

*Distr.* Yunnan (ex Hook. f., l.c.).

**Biophytum sensitivum**, *DC.*—F.B.I., i. p. 436; Williams, Bull. Herb. Boiss., v. (1905) p. 217.

Chiengmai, Doi Sootep, 300 m., *Kerr*, 805.

*Distr.* Tropics.

## Rutaceae.

**Evodia triphylla**, *DC.*—F.B.I., i. p. 487; For. Fl. Burma, i. p. 180.

Chiengmai, in evergreen jungle on Doi Sootep, 1050–1350 m., *Kerr* 1109, 1286.

*Distr.* Burma, China.

**Zanthoxylum acanthopodium**, *DC.*—F.B.I., i. p. 493; For. Fl. Burma, i. p. 181.

Chiengmai, Doi Sootep, 1500–1650 m., *Kerr*, 1103.

*Distr.* Himalaya and Khasia Hills, Burma, China.

**Glycosmis pentaphylla**, *Correa*, var. a, *Oliver*, Journ. Linn. Soc., v. suppl. 2 p. 37; F.B.I., i. p. 500. *G. pentaphylla*, Correa—For. Fl. Burma, i. p. 186?; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 30.

Chiengmai, in scrub jungle, 300 m., *Kerr*, 1265.

*Distr.* Throughout India, Indo-China, Malaya, Australia.

**Micromelum hirsutum**, *Oliver*—F.B.I., i. p. 502; For. Fl. Burma, i. p. 187; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 30.

*Siam Forest Service*, 141.

*Distr.* Burma, Malaya.

**Micromelum pubescens**, *Blume*—F.B.I., i. p. 501; For. Fl. Burma, i. p. 186.

Lakon, Hooey Meh Tan, 450 m., *Kerr*, 1017; Kow Sabap, 690 m., *Murton*, 108; Kow Hoo Wen, *Murton*, 107.

*Distr.* Himalaya, Burma, China, Malaya.

**Triphasia trifoliata**, *DC.*—F.B.I., i. p. 507; For. Fl. Burma, i. p. 192.

Bangkok, *Zimmermann*, 138.

*Distr.* Tropics.

**Clausena excavata**, *Burm.*—F.B.I., i. p. 504; For. Fl. Burma, i. p. 188.

Near Meh Maŭ, 300 m., *Kerr*, 1007; *Siam Forest Service*, 162.

*Distr.* E. Himalaya, Yunnan, Malaya, Philippines.

**Clausena Wallichii**, *Oliver?*

Doi Saket, near Ban Sun Pak Suk, 600 m., *Kerr*, 1027.

I have been unable to confirm this identification by reference to any authentic material of the species.

**Luvunga scandens**, *Ham.*—F.B.I., i. p. 509; For. Fl. Burma, i. p. 191.

Chiengmai, Doi Sootep, 800 m., *Hosseus*, 430.

*Distr.* India, Burma, Cochinchina, Sumatra.

## Simarubaceae.

**Quassia amara**, *Linn.*
Bangkok, *Zimmermann*, 67, 169.
*Distr.* Native of Trop. America, often cultivated in Tropics.

**Picrasma javanica**, *Blume*—F.B.I., i. p. 520 ; For. Fl. Burma, i. p. 201.
Meh Ping, Doi Chieng Dao, 420 m., *Kerr*, 1057.
*Distr.* Burma, Malacca, Java.

**Brucea mollis**, *Wall.*—F.B.I., i. p. 521 ; For. Fl. Burma, i. p. 202.
Chiengmai, Doi Sootep, 1000 m., *Hosseus*, 432.
*Distr.* E. Himalaya, Burma.

**Brucea sumatrana**, *Roxb.*—F.B.I., i. p. 521 ; For. Fl. Burma, i. p. 202.
Chiengmai, Doi Sootep, 300 m., *Kerr*, 589.
*Distr.* India, Burma, China, Malaya.

**Eurycoma longifolia**, *Jack*—F.B.I., i. p. 521 ; For. Fl. Burma, i. p. 202 ; Williams, Bull. Herb. Boiss., v. (1905) p. 218.
Chiengmai, Doi Sootep, 450–750 m., *Kerr*, 633, *Hosseus*, 479a.
*Distr.* Burma, Malaya, Philippines.

**Irvingia malayana**, *Oliver*—F.B.I., i. p. 522.
Chiengmai, Doi Sootep, 300 m., *Kerr*, 1141, 1141a.
*Distr.* Malacca.

**Harrisonia Bennetii**, *Planch.*—F.B.I., i. p. 519 ; For. Fl. Burma, i. p. 203 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 31.
Doi Chieng Dao, 450 m., *Kerr*, 1048, 1048a.
*Distr.* Burma, China, Malaya.
Lao name, Mai Chi.

## Ochnaceae.

**Ochna Wallichii**, *Planch.*—F.B.I., i. p. 524 ; For. Fl. Burma, i. p. 205.
Chiengmai, Doi Sootep, 300–600 m., *Kerr*, 544, *Hosseus*, 445 ; *Siam Forest Service*, 176.
*Distr.* Burma.

## Burseraceae.

**Garuga pinnata**, *Roxb.*—F.B.I., i. p. 528 ; For. Fl. Burma, i. p. 207 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 31.
Near Pang Pooey, 420 m., *Kerr*, 1002.
*Distr.* India, Malaya.

**Protium serratum**, *Engler. Bursera serrata*, Colebr.—F.B.I., i. p. 530 ; For. Fl. Burma, i. p. 208.
Chiengmai, in eng jungle, 300m., *Kerr*, 581.
*Distr.* Bengal, Burma, Assam.

**Canarium Kerrii**, *Craib*, sp. n., facie *C. resinifero*, Brace ex King, similis sed foliolis fere glabris, inflorescentiae rachi breviter parce puberulo, drupa paulo breviore basi rotundata distincta.
*Arbor* parva vel mediocris (*ex Kerr*) ; ramuli teretes, juventute fulvo-tomentelli vel villosi, demum puberuli vel fere glabri, cortice

rubro-brunneo lenticellato striato obtecti. *Folia* 7–9 foliolata, 22–29 cm. longa ; petiolus communis 11·5–14 cm. longus, cum rachi sulcatus minuteque puberulus ; stipulae deciduae, lineari-lanceolatae, ad 9 mm. longae, fulvo-villosae ; foliola opposita, variabilia, plerumque oblonga vel ovato-lanceolata, apice breviter acuminata, obtusa, basi interdum inaequalia, cuneata, truncata vel cordata, 8–15·5 cm. longa, 4·3–8·5 cm. lata, rigide chartacea, margine subintegra, glabra nisi costa supra, costa nervisque primariis subtus puberulis, nervis lateralibus utrinque 10–13 intra marginem arcuatis supra prominulis subtus prominentibus, nervulis utrinque prominulis; petioluli puberuli, 5–13 mm. longi, foliolo terminali a lateralibus 2–2·8 cm. distante. *Inflorescentia* ♂ e cymis racemose dispositis 6·5–9·5 cm. longa, pedunculo communi 6–9 cm. longo, pedunculis partialibus ad 1·5 cm. longis ; bracteae lineari-lanceolatae, 5 mm. longae, utrinque pubescentes. *Calyx* 4 mm. longus, 2·5 mm. diametro, lobis 3 brevibus, extus breviter appresse pilulosus. *Corolla* longe exserta, vix 1 cm. longa, petalis 3 lineari-oblanceolatis indumento extus ut in calyce. *Stamina* 6, filamentis 6 mm. longis ad medium in tubum connatis. *Ovarii* rudimentum parvum, breviter hirsutum. *Inflorescentia* ♀ ignota. *Infructescentia* quam inflorescentia ♂ dimidio brevior. *Drupa* ovoidea, 3 cm. alta, 2 cm. diametro, glabra, sicco nigra, endocarpio ligneo 2–2·5 mm. lato.

Chiengmai, mixed jungle at foot of Doi Sootep, 300 m., *Kerr*, 605.

## Meliaceae.

**Melia Azadirachta**, *Linn.*—F.B.I., i. p. 544 ; For. Fl. Burma, i. p. 212.

Chiengmai, 300 m., *Kerr*, 542.

In a note Kerr says this tree may be merely cultivated as it occurs always near houses. The flowers and young leaves, which are bitter, are boiled and eaten with rice.

Lao name, Saliem.

**Melia Toosendan**, *Sieb. et Zucc.*—King, Journ. As. Soc. Beng., lxiv. p. 20.

Muang Prow, Meh Kaut, 450 m., *Kerr*, 1034.

*Distr.* Japan, Khasia, Manipur, Sumatra.

Lao name, Mai Krien.

**Amoora Rohituka**, *W. et. A.*—F.B.I., i. p. 559 ; For. Fl. Burma, i. p. 220 ; Williams, Bull. Herb. Boiss., v. (1905) p. 218.

Chiengmai, Doi Sootep, 900 m., *Kerr*, 713.

*Distr.* India, China, Malay Peninsula, Sumatra.

**Walsura villosa**, *Wall.*—F.B.I., i. p. 564 ; For. Fl. Burma, i. p. 223 ; Williams, Bull. Herb. Boiss., v. (1905) p. 219.

Meh Kung, 450 m., *Kerr*, 1023.

*Distr.* Burma, Cochinchina.

Lao name, Mai Ki Qau.

**Heynea trijuga**, *Roxb.*—F.B.I., i. p. 564. *Walsura trijuga*, Kurz, For. Fl. Burma, i. p. 225.

Chiengmai, Doi Sootep, 300 m., *Kerr*, 591.

*Distr.* India, Burma, Yunnan, Malay Peninsula.

## Olacaceae.

**Olax scandens**, *Roxb.*—F.B.I., i. p. 575; For. Fl. Burma, i. p. 233; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 31. *Loranthus securidacoides*, Warb. apud De Willd., Pl. Nov. Herb. Hort. Then., Tab. lxxxi.

Chiengmai, Doi Sootep, 300 m., *Kerr*, 1222; Bangkok, *Zimmermann*, 119; Lem Tong Lan, *Murton*, 127.

*Distr.* India, Burma, China, Java.

**Anacalosa ilicoides**, *Mast.*, F.B.I., i. p. 580.

Chiengmai, Doi Sootep, 600–750 m., *Kerr*, 1192.

*Distr.* Khasia.

## Icacinaceae.

**Pittosporopsis**, *Craib*, gen. nov., *Apodyti*, E. Mey., affine, inflorescentia axillari tantum, calyce majore 5-partito, petalis apice induplicato-valvatis inferne apertis, antherarum connectivo producto, stylo haud excentrico distinctum.

*Flores* hermaphroditi. *Calyx* 5-partitus, diu persistens. *Petala* 5, spathulata, apice induplicato-valvata, basi aperta. *Stamina* 5, petalis alterna iisque basi brevissime adnata; filamenta complanata, superne subito contracta; antherae oblongae, basi bilobae, dorso affixae, connectivo apice producto. *Discus* ovario adnatus. *Ovarium* ellipsoideum, uniloculare, ovulis 2 pendulis; stylus sub anthesin rectus, mox basin versus geniculatus, diu persistens. *Fructus* immaturus tantum visus; pedicelli nodus supremus articulatus, incrassatus, cum fructu deciduus.—*Frutex* inermis. *Folia* simplicia, alterna, chartacea, margine cartilagineo undulato. *Inflorescentia* axillaris, cymosa, floribus majusculis.

Species unica.

**Pittosporopsis Kerrii**, *Craib*, sp. n.

*Frutex* ad 4·5 m. altus (*ex Kerr*); ramuli subteretes, glabri, cortice fusco-brunneo obtecti. *Folia* oblongo-oblanceolata vel oblonga, apice acuminata vel fere caudato-acuminata, apice subobtusa, basi cuneata, 14–21 cm. longa, 4–6·5 cm. lata, chartacea, utrinque glabra nisi costa subtus minute parceque pilulosa, margine cartilagineo undulato, nervis lateralibus utrinque 5–7 intra marginem arcuatis supra leviter impressis subtus cum nervis transversis prominentibus; petioli 2 cm. longi, supra canaliculati, fere glabri. *Inflorescentia* axillaris, pedunculo communi 1·5–2·5 cm. longo; cymulae 3-florae, pedunculo circiter 4 mm. longo suffultae; pedicelli breves, nodis supremis articulatis, bracteolis 3–4 parvis infra articulationem instructi. *Calycis* lobi late deltoidei, acuti, 1 mm. longi, 1 mm. lati, extus pilulosi, sub anthesin reflexi, infructescentes fructui appressi. *Petala* elongato-spathulata, circiter 7 mm. longa 2 mm. lata, extus medio parcissime pilulosa. *Filamenta* complanata, superne subito contracta, 5 mm. longa, basi 0·75 mm. lata; antherae versatiles, oblongae, basi bilobae, fere 2 mm. longae, connectivo apice producto. *Discus* cupularis, ovario adnatus, circiter 0·75 mm. altus. *Ovarium* glabrum, circiter 1·75 mm. altum, ovulis 2 pendulis; stylus crassiusculus, apice brevissime bifidus, 3 mm. longus, glaber. *Fructus* immaturus, cum pedicelli nodo supremo leviter incrassato deciduus.

Chiengmai, in evergreen jungle on Doi Sootep, 750 m., *Kerr*, 558.

*Distr.* Burma, S. Shan States, *Macgregor*, (Herb. Kew et Calcutta).

### Aquifoliaceae.

**Ilex sulcata**, *Wall.*—F.B.I., i. p. 604.

Chiengmai, in evergreen jungle on Doi Sootep, 900 m., *Kerr*, 1120.

*Distr.* Bengal, Assam, Burma.

Probably identical with *I. Godayam*, Kurz, For. Fl. Burma, i. p. 245 (ex Brandis).

### Celastraceae.

**Euonymus** sp. n.? near *E. glaber*, Roxb. and *E. timoriensis*, Zipp.

Chiengmai, Doi Sootep, 720–1200 m., *Kerr*, 649, 736.

In the absence of fruit I hesitate to describe this as new.

**Celastrus paniculata**, *Willd.*—F.B.I., i. p. 617; For. Fl. Burma, i. p. 252; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 32; Williams, Bull. Herb. Boiss., v. (1905) p. 224.

Chiengmai, Doi Sootep, 320 m., *Kerr*, 586.

*Distr.* India, Malaya.

**Salacia prinoides**, *DC.*—F.B.I., i. p. 626; For. Fl. Burma, i. p. 260.

Palat, 300 m., *Kerr*, 1008.

*Distr.* India, Burma, Malaya.

### Rhamnaceae.

**Ventilago calyculata**, *Tul.*—F.B.I., i. p. 631; For. Fl. Burma, i. p. 262; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 33.

Hooey Meh Tan, 420 m., *Kerr*, 1015.

*Distr.* India, Malaya.

**Zizyphus Jujuba**, *Lamk.*—F.B.I., i. p. 632; For. Fl. Burma, i. p. 266.

Chiengmai, 300 m., *Kerr*, 1229.

*Distr.* Afghanistan eastwards to China, Malaya, Australia, Africa.

Lao name, Mă Tan.

**Zizyphus Oenophila**, *Mill.*—F.B.I., i. p. 634; For. Fl. Burma, i. p. 266; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 33.

Chiengmai, Doi Sootep, 300–900 m., *Kerr*, 696.

*Distr.* Tropical Asia, Australia.

**Zizyphus rugosa**, *Lamk.*—F.B.I., i. p. 636; For. Fl. Burma, i. p. 265; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 33.

Chiengmai, in deciduous jungle on Doi Sootep, 300–720 m., *Kerr*, 564, 1077, 1077a.

*Distr.* India, Burma.

**Colubrina asiatica**, *Brongn.*—F.B.I., i. p. 642; For. Fl. Burma, i. p. 268.

Paknampo, *Hosseus*, 20.

*Distr.* India, Burma, China, Malaya, Australia.

Colubrina pubescens, *Kurz*—F.B.I., i. p. 642; For. Fl. Burma, i. p. 269.
*Siam Forest Service*, 165.
*Distr.* Burma.

## Ampelidaceae.

Tetrastigma cruciatum, *Craib et Gagnep.*, sp. n., a *T. tuberculato*, Blume (sub *Cisso*), stigmate grandi sessili cruciato valde distinctum. *Ramuli* scandentes, glabri, primo fere teretes, graciles, mox compressi, dense tuberculati. *Folia* trifoliolata, petiolis 2·7–4·5 cm. longis suffulta; foliola oblanceolata vel anguste obovata, apice acuminata, mucronata, basi terminalia in petiolulum attenuata, lateralia obtusa parum obliqua, 8–11·5 cm. longa, 3·5–5·5 cm. lata, subcoriacea, utrinque glabra, juventa distanter crasse serrata, mox subintegra subsinuata, nervis lateralibus utrinque 4–6 intra marginem arcuatis pagina neutra valde conspicuis; petioluli semicentimetrales, inter se aequales. *Inflorescentia* axillaris, globosa, congesta, 1 cm. diametro; pedicelli compressi, 1–2 mm. longi, dense pilosi; alabastra cylindracea apice dilatato-truncata, papillata. *Calyx* brevis, cupuliformis, pilulosus, dentibus triangularibus acutis. *Petala* alba, deltoidea, fere 2 mm. longa, 1·25 mm. lata, ad marginem apicemque papillata, corniculata, corniculis brevibus, divaricatis papillatis 0·5 mm. longis. *Discus* brevis, annularis, ad basin ovarii adnatus, ovarium strangulans. *Stamina* fertilia non visa. *Ovarium* glabrum, vix 1 mm. altum, loculis 2 biovulatis; stigma sessile, cruciatum, circiter 1 cm. diametro, ramis 4 divaricatis apice sensim dilatatis truncato-emarginatis.

Chiengmai, in thick evergreen jungle on Doi Sootep, 900 m., *Kerr*, 599.

Mons. Gagnepain, who is at present engaged in a study of the species of *Vitis* and allied genera and who has kindly collaborated with me in the description of this species, has supplied very copious notes on two allies of this plant.

*T. cruciatum* differs from *T. rupestre*, Planch., in (1) its petiolules being equal and its leaflets more symmetric at the base; (2) its sessile inflorescence; (3) its corolla not all papillose; (4) its large Maltese cross-shaped stigma; and (5) its small acute calyx teeth.

From *T. glabratum*, Planch., it is distinguished by (1) its larger leaflets with equal petiolules; (2) its more condensed and much narrower inflorescence; (3) its shorter flower buds; (4) its corniculate petals; (5) its large sessile stigma; and (6) its short acute (not truncate) calyx teeth.

Mons. Gagnepain further remarks that *T. cruciatum* possesses the largest stigma of the species examined by him.

Tetrastigma lanceolarium, *Planch.* p.p. *Vitis lanceolaria*, Roxb.—F.B.I., i. p. 660; For. Fl. Burma, i. p. 272.
Chiengmai, Doi Sootep, 720 m., *Kerr*, 919.
*Distr.* India, Burma, Assam, China, Malay Peninsula.

Parthenocissus semicordata, *Planch.* *Vitis semicordata*, Wall.—King, Journ. As. Soc. Beng., lxv. p. 113. *V. himalayana*, Brandis, var. *semicordata*, Lawson, F.B.I., i. p. 656; For. Fl. Burma, i. p. 273.

Chiengmai, in evergreen jungle on Doi Sootep, 1590 m., *Kerr*, 1296.

*Distr.* Sikkim, Khasia.

**Cissus adnata**, *Roxb.* *Vitis adnata*, Wall.—F.B.I., i. p. 649 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 33.

Chiengmai, in scrub jungle at foot of Doi Sootep, 330 m., *Kerr*, 1233.

*Distr.* India, throughout Indo-China, Malaya.

**Cissus assamica**, *Craib*, comb. nov. *Vitis assamica*, Lawson, F.B.I., i. p. 648.

Chiengmai, in scrub jungle at foot of Doi Sootep, 330 m., *Kerr*, 1232.

*Distr.* Assam, Bengal, (Burma ?).

Planchon in his monograph includes this plant under *C. adnata* as a "forma glabrior."

**Cissus carnosa**, *Lamk.* *Vitis carnosa*, Wall.—F.B.I., i. p. 654.

Chiengmai, in scrub jungle, 300 m., *Kerr*, 1228.

*Distr.* India, Burma, Assam, China, Malaya.

**Cissus discolor**, *Blume.* *Vitis discolor*, Dalz.—F.B.I., i. p. 647 ; For. Fl. Burma, i. p. 271 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 33.

Chiengmai, in evergreen jungle on Doi Sootep, 720–1350 m., *Kerr*, 726.

*Distr.* India, Burma, Assam, Malaya.

**Cissus Kerrii**, *Craib*, sp. n., ab affini *C. repente*, Lamk., foliis lobatis valde distincta.

*Planta* disco excepto glaberrima ; ramuli teretes, sulcati, 3 mm. diametro, juventute lepidoti, mox ut in *C. repente* albi. *Folia* ambitu interdum reniformia plerumque late ovata vel rotundata, basi cordata, 3-lobata lobis deltoideis apice acutis mucronatis, 6–11 cm. longa, 5–10·5 cm. lata, chartacea, margine remote denticulato-serrata, trinervata, nervis secondariis (e costa ortis) utrinque 4–5 omnibus utrinque prominulis nervis transversis subtus conspicuis ; petioli 2–6·5 cm. longi ; stipulae deciduae, oblongae, basi truncatae, apice rotundatae, 5 mm. longae, 2·5 mm. latae ; cirrhi oppositifolii, simplices. *Cymae* oppositifoliae, umbellatim dispositae, pedunculo communi ad 4 cm. longo, pedunculis partialibus 1–1·5 cm. longis ; bracteae parvae. *Calyx* cupuliformis, 1 mm. diametro. *Petala* 4, oblonga, cucullata, 2·5 mm. longa, 1·75 mm. lata. *Stamina* 4, filamentis 1·25 mm. longis. *Discus* ovario aequialtus, margine crenulato interdum parcissime puberulo. *Stylus* brevis, obtusus. *Fructus* ignotus.

Chiengmai, in scrub jungle, 300 m., *Kerr*, 1238.

**Cissus pedata**, *Lamk.* *Vitis pedata*, Vahl—F.B.I., i. p. 661 ; For. Fl. Burma, i. p. 273.

Chiengmai, Doi Sootep, 330 m., *Kerr*, 1210.

*Distr.* India, Burma, Assam, Java.

**Ampelocissus Martini**, *Planch.*, DC. Monogr., v. 2, p. 373. *Vitis barbata*, Wall., var. *trilobata*, King—Williams, Bull. Herb. Boiss., v. (1905) p. 216.

Chiengmai, in mixed jungle at foot of Doi Sootep, 330 m., *Kerr*, 1206.

*Distr.* Cambodia, Cochinchina, Malay Peninsula (Hong Kong, cult.).

## Sapindaceae.

**Cardiospermum Halicacabum**, *Linn.*—F.B.I., i. p. 670.

Chiengmai, in scrub jungle on banks of Meh Ping, 300 m., *Kerr*, 757.

*Distr.* Tropics.

**Allophylus varians**, *Craib*, sp .n., habitu *A. longipidi*, Radlkofer, similis sed racemis saepissime haud furcatis differt.

*Fruticulus* 1·2 m. altus (*fide Kerr*); ramuli teretes, 3 mm. diametro, fere glabri, cortice rubro-brunneo obtecti. *Folia* trifoliolata ; foliola breviter petiolulata, oblanceolata vel oblongo-lanceolata, apice acuminata obtusa, basi terminalia cuneata lateralia inaequalia obtusa, foliorum ramulorum apices versus maxima ad 19 cm. longa 5·5 cm. lata, foliorum paulo inferius 4·5–12·5 cm. longa, 1·8–4 cm. lata, membranacea, juventute utrinque pilulosa mox fere glabra, margine praecipue a medio apices versus distanter serrata, nervis lateralibus utrinque 10–11 ad marginem excurrentibus cum costa supra conspicuis subtus prominulis nervis transversis utrinque, subtus magis, conspicuis ; petioli foliorum majorum 10·5–13·5 cm. longi, minorum 3–6 cm. longi, supra canaliculati, puberuli vel fere glabri. *Thyrsi* axillares, solitarii, saepissime simplices, 7–15 cm. longi, pedunculo communi 1·5–2·5 cm. longo, fere glabri. *Pedicelli* graciles, 2 mm. longi, glabri. *Flores* albi, mediocres, glabri. *Fructus* ignotus.

Chiengmai, thin bush about 1·2 m. high in evergreen jungle on Doi Sootep, 900 m., *Kerr*, 685.

**Schleichera trijuga**, *Willd.*—F.B.I., i. p. 681 ; For. Fl. Burma, i. p. 289 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 36.

Chiengmai, Doi Sootep, 300–330 m., *Kerr*, 571, 1184 ; Ban Pou, Meh Saang, 390 m., *Kerr*, 1062.

*Distr.* India, Burma, Malaya.

Lao name, Ma Chohk.

**Otophora cambodiana**, *Pierre*

Bangkok, *Zimmermann*, 112.

*Distr.* Cambodia.

## Staphyleaceae.

**Turpinia nepalensis**, *Wall.*—For. Fl. Burma, i. p. 292. *T. pomifera*, Wall.—F.B.I., i. p. 698 p. p.

Chiengmai, Doi Sootep, 1600 m., *Hosseus*, 504.

*Distr.* India, Burma, China.

**Turpinia pomifera**, *Wall.*—F.B.I., i. p. 698 p. p. ; For. Fl. Burma, i. p. 292 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 36.

Chiengmai, Doi Sootep, 720 m., *Kerr*, 536 ; between Muang Prow and Chieng Dao, 600 m., *Kerr*, 1047.

*Distr.* India, throughout Indo-China, Malaya.

## Sabiaceae.

**Meliosma simplicifolia**, *Roxb.*—F.B.I., ii. p. 5 ; For. Fl. Burma, i. p. 301.

Muang Prow, Hooey Meh Wah, 540 m., *Kerr*, 1041.

*Distr.* India, Burma, Assam, Yunnan.

**Meliosma simplicifolia**, *Roxb.*, var. **sootepensis**, *Craib*, var. nov., a typo ramulorum indumento parciore, cortice rubro-brunneo haud nigro, foliis oblongo-oblanceolatis apice obtusis vix acuminatis integris, foliorum maturorum nervis supra leviter impressis subtus valde prominentibus differt.

Chiengmai, Doi Sootep, 720 m., *Kerr*, 535.

According to Dr. Kerr this tree, which is about 12 m. high has the young branches mostly hollow and inhabited by a small black ant.

## Anacardiaceae.

**Buchanania latifolia**, *Roxb.*—F.B.I., ii. p. 23 ; For. Fl. Burma, i. p. 307 ; Fl. Indo-Chine, ii. p. 10.

Chiengmai, Doi Sootep, 300–450 m., *Kerr*, 946.

*Distr.* India, Burma, Yunnan, Cambodia.

**Buchanania** sp. aff. *B. glabrae*, Wall.

Wang Djao, *Hosseus*, 144 ; Chiengmai, Doi Sootep, *Hosseus*, 283.

Probably represents a new species but the material in Herb. Kew is too incomplete to admit of certainty.

**Melanorrhoea usitata**, *Wall.*—F.B.I., ii. p. 25 ; For. Fl. Burma, i. p. 318 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 36 ; Fl. Indo-Chine, ii. p. 25.

Chiengmai, Doi Sootep, 300–900 m., *Kerr*, 933.

*Distr.* Throughout Indo-China, Malay Peninsula.

Lao name, Mai Hak.

**Odina Wodier**, *Roxb.*—F.B.I., ii. p. 29 ; For. Fl. Burma, i. p. 321 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 36 ; Fl. Indo-Chine, ii. p. 34.

Between Lakon and Phre, 300 m., *Kerr*, 978 ; Pang Pooey, 420 m., *Kerr*, 1003.

*Distr.* India, Burma, Malaya.

**Spondias mangifera**, *Willd.*—F.B.I., ii. p. 42 ; For. Fl. Burma, i. p. 322 ; Fl. Indo-Chine, ii. p. 28.

Hills between Muang Prow and Chieng Dao, 600 m., *Kerr*, 1045.

*Distr.* India, Burma, China, Cochinchina, Malaya.

Lao name, Mă Kauk.

## Connaraceae.

**Connarus gibbosus**, *Wall.*—F.B.I., ii. p. 52 ; For. Fl. Burma, i. p. 327 ; Williams, Bull. Herb. Boiss., iv. (1904) p. 1034.

Chiengmai, Doi Sootep, 720 m., *Kerr*, 1071.

*Distr.* Burma, Malay Peninsula.

**Ellipanthus tomentosus**, *Kurz*—F.B.I., ii. p. 56 ; For. Fl. Burma, i. p. 330 ; Prain, Journ. As. Soc. Beng., lix. p. 209.
Lakon plain, 300 m., *Kerr*, 972.
*Distr.* Burma.

## Leguminosae.

**Crotalaria acicularis**, *Ham.*—F.B.I., ii. p. 68 ; Prain, Journ. As. Soc. Beng., lxvi. p. 349. *C. humifusa*, Drake, Journ. de Bot., v. p. 186 ; C. B. Clarke apud Ostenfeld, Bull. Herb. Boiss., v. (1905) p. 713 ; *non* Grah.
Raheng, *Lindhard*, 27.
*Distr.* Madras, Bengal to Tenasserim, China, Tonkin, Java.

**Crotalaria alata**, *Ham.*—F.B.I., ii. p. 69 ; *non* Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 37.
Chiengmai, Doi Sootep, 450–600 m., *Kerr*, 776 ; Wang Djao, *Hosseus*, 59a ; Petchabouri, *Hosseus*, 714a.
*Distr.* Kumaon to Khasia, Burma, China, Java.

**Crotalaria albida**, *Heyne*—F.B.I., ii. p. 71 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 38.
Chiengmai, evergreen jungle on Doi Sootep, 1050 m., *Kerr*, 876.
*Distr.* India, Burma, China, Malaya.

**Crotalaria assamica**, *Benth.*—F.B.I., ii. p. 75 ; Prain, Journ. As. Soc. Beng., lxvi. p. 352.
Chiengmai, Doi Sootep, 700–720 m., *Kerr*, 830, *Hosseus*, 302.
*Distr.* Assam, Upper Burma, China, Philippines.

**Crotalaria bracteata**, *Roxb.*—F.B.I., ii. p. 83.
Meh Ping Rapids, near Ban Kan, 180 m., *Kerr*, 909.
*Distr.* India, Burma, Yunnan, Philippines.

**Crotalaria Hossei**, *Craib*, sp. n., floribus leguminibusque *C. albidae*, Heyne, foliis *C. linifoliae*, Linn., similis, ab ambabus habitu distincta.

*Rhizoma* lignosum, ad 26 cm. longum. *Caules* solitarii, plerumque usque ad inflorescentiam simplices, 30–70 cm. alti, albo-strigillosi. *Folia* linearia vel lineari-oblanceolata, apice subacuta vel rotundata, mucronata, basi obtusa, 1–2 cm. longa, 2–4·5 mm. lata, brevissime petiolata, margine integro, subcoriacea, supra fere glabra, subtus indumento ut in caule, costa supra subconspicua subtus prominente, nervis obscuris. *Inflorescentiae* rami 4–8, corymbosim dispositi. *Racemi* circiter 8 cm. longi, laxiusculi ; bracteae parvae, persistentes ; pedicelli vix 3 mm. attingentes. *Calyx* bilabiatus, extus appresse flavo-hirsutus ; labium superius e lobis duobus oblongo-lanceolatis acutis 3·5 mm. longis 2·5 mm. latis, inferius e lobis tribus lanceolatis acutis 4·5 mm. longis 1 mm. latis. *Corolla* lutea (*ex Kerr*) ; vexillum reflexum, oblongum, apice emarginatum, 5·5 mm. longum, 5 mm. latum, basi squamis duabus 1 mm. longis et latis margine subintegro instructum, extus superne parce fulvo-hirsutum, ungui brevi albo-piloso-ciliato suffultum ; alae oblongae, 5 mm. longae, 2 mm. latae, glabrae, foveolatae, ungui 1 mm. longo ; carina 4·5 mm. longa, 5 mm. lata, marginibus liberis albo-piloso-ciliatis, ungui 1 mm. longo. *Stamina* generis ; tubus circiter 2 mm. longus, filamentis longioribus subaequalis. *Ovarium* subsessile, 3 mm. altum, glabrum, 8-ovulatum ; stylus 4·5 mm. longus, parce

pilosus. *Legumen* oblongum, sessile, 1 cm. longum, 4 mm. latum, apice truncatum, calyce stylique basi persistentibus.

Wang Djao, *Hosseus*, 59; Chiengmai, in eng jungle on Doi Sootep, 300–600 m., *Kerr*, 839. (Herb. Kew, Mus. Brit. et Calcutta.)

**Crotalaria medicaginea**, *Lamk.*—F.B.I., ii. p. 81.

Meh Ping Rapids, Ban Kan, 180 m., *Kerr*, 908; Sea shore, Cape Liant, *Murton*, 36.

*Distr.* India, China.

**Crotalaria neriifolia**, *Wall.*—F.B.I., ii. p. 74; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 39; Prain, Journ. As. Soc. Beng., lxvi. p. 352.

Chiengmai, Doi Sootep, 300–700 m., *Kerr*, 829, *Hosseus*, 287.

*Distr.* Burma.

**Crotalaria peguana**, *Benth. ex Baker*, F.B.I., ii. p. 77.

Chiengmai, Doi Sootep, 1350 m., *Kerr*, 784, *Hosseus*, 209.

*Distr.* Upper Burma.

Closely allied to, and possibly identical with, *C. Kurzii*, Baker.

**Crotalaria sessiliflora**, *Linn.*—F.B.I., ii. p. 73; Prain, Journ. As. Soc. Beng., lxvi. p. 351.

Chiengmai, in mixed jungle on Doi Sootep, 300–540 m., *Kerr*, 898; Wang Djao, *Hosseus*, 112.

*Distr.* Himalaya, China, Burma, Philippines.

**Crotalaria striata**, *DC.*—F.B.I., ii. p. 84. *C. Saltiana*, Prain, Journ. As. Soc. Beng., lxvi. p. 353, *non* Andr. *C. siamica*, Williams, Bull. Herb. Boiss., v. (1905) p. 20.

Bangkok, *Zimmermann*, 135.

*Distr.* Tropics.

**Crotalaria verrucosa**, *Linn.*—F.B.I., ii. p. 77.

Meh Ping Rapids, Ban Kan, 180 m., *Kerr*, 910.

*Distr.* Tropics.

**Indigofera endecaphylla**, *Jacq.*—F.B.I., ii. p. 98; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 39.

Anhin, *Schomburgk*, 258.

*Distr.* India, Burma, China, Africa.

**Indigofera linifolia**, *Retz.*—F.B.I., ii. p. 93; Prain, Journ. As. Soc. Beng., lxvi. p. 355.

Cape Liant, *Murton*, 35.

*Distr.* Afghanistan, India, Burma, China, Malaya, Australia, Africa.

**Indigofera pulchella**, *Roxb.*—F.B.I., ii. p. 101; For. Fl. Burma, i. p. 361; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 39.

Ban Meh Wang, 300 m., *Hosseus*, 362, *Kerr*, 1006.

*Distr.* N. India, Burma, China.

**Indigofera siamensis**, *Hosseus*, Fedde Repert. Nov. Sp., iv. (1907) p. 291.

Wang Djao, *Hosseus*, 120.

**Indigofera sootepensis**, *Craib*, sp. n., affinis *I. galegoidi*, DC., a qua ramorum foliorumque novorum indumento brunneo haud albo, foliolis numerosioribus, bracteis stipulisque longioribus, legumine fere dimidio breviore turgidiore differt.

*Frutex* ad 2·5 m. altus (*ex Kerr*). *Rami* flexuosi, subangulati, juventute dense brunneo-pubescentes, mox parce brevissime appresse strigillosi, cortice brunneo. *Folia* 15–18 cm. longa, petiolo ad 1 cm. longo, rachi supra canaliculato ; stipulae e basi fere 1 mm. lata longe attenuatae, ad 12 mm. longae ; foliola 37–41, opposita nisi infima subopposita, anguste oblonga, vel terminalia obovata, apice rotundata, mucronata, basi rotundata vel terminalia cuneata, 1·5–3 cm. longa, 6–8 mm. lata, tenuiter chartacea, utrinque parce pubescentia, margine integro, nervo primario utrinque conspicuo, nervis lateralibus obscuris, supra fusca subtus pallide viridia ; stipellae minutae ; petioluli circiter 2 mm. longi. *Racemi* axillares, usque ad apices ramorum, multiflori, ad 9 cm. longi, pedunculo 1 cm. longo. *Flores* breviter pedicellati, bracteis deciduis alabastra superantibus. *Calyx* fere 2 mm. longus, dentibus parvis, dense strigillosus. *Corolla* longe exserta, circiter 1 cm. longa, vexillo carinaque extus dense brunneo-strigillosis. *Legumen* teres, ad 4·5 cm. longum, 5 mm. diametro, basi attenuatum, parce puberulum.

Chiengmai, in deciduous jungle on Doi Sootep, 480–900 m., *Kerr*, 684.

**Indigofera squalida**, *Prain*, Journ. As. Soc. Beng., lxvi. p. 355.

Chiengmai, in deciduous jungle on Doi Sootep, 480 m., *Kerr*, 658.

*Distr.* Upper Burma.

**Tephrosia purpurea**, *Pers.*—F.B.I., ii. p. 112.

Chiengmai, on waste ground, 300 m., *Kerr*, 710 ; Anhin, *Schomburgk*, 253.

*Distr.* S. E. Asia, S. Africa.

**Millettia auriculata**, *Baker*, var. **extensa**, *Benth.*—Prain, Journ. As. Soc. Beng., lxvi. p. 363. *M. extensa*, Benth.—F.B.I., ii. p. 109 ; For. Fl. Burma, i. p. 352.

Chiengmai, Doi Sootep, 450–750 m., *Kerr*, 595.

*Distr.* (of var.) Burma.

**Millettia Brandisiana**, *Kurz*—F.B.I., ii. p. 108 ; For. Fl. Burma, i. p. 355 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 40.

Near Ban Meh Tah, 300 m., *Kerr*, 985 ; *Siam Forest Service*, 147.

*Distr.* Burma.

The material of *Hosseus*, 140, is rather scanty in Herb. Kew but it is evidently allied to this species.

**Millettia ovalifolia**, *Kurz*—F.B.I., ii. p. 107 ; For. Fl. Burma, i. p. 356.

Siam, *Teysmann*, 6026 in Herb. Bog.

*Distr.* Burma.

**Sesbania aculeata**, *Pers.*—F.B.I., ii. p. 114 ; Prain, Journ. As. Soc. Beng., lxvi. p. 369 ; Williams, Bull. Herb. Boiss., v. (1905) p. 20.

Chiengmai, in marshy ground, 300 m., *Kerr*, 811.

*Distr.* Tropics.

**Sesbania grandiflora**, *Pers.*—F.B.I., ii. p. 115 ; For. Fl. Burma, i. p. 362 ; Prain, Journ. As. Soc. Beng., lxvi. p. 370 ; Williams, Bull. Herb. Boiss., v. (1905) p. 20.

Chiengmai, near villages, 300 m., *Kerr*, 964.
*Distr.* India, Malaya, Australia, Mascarene Is.
Lao name, Dauk Kaa.

**Aeschynomene indica**, *Linn.*—F.B.I., ii. p. 151.
Chiengmai, in marshy ground, 300 m., *Kerr*, 768.
*Distr.* Tropics.

**Desmodium auricomum**, *Grah.*—F.B.I., ii. p. 172.
Raheng, *Lindhard*, 26.
*Distr.* Martaban, Tenasserim.

**Desmodium capitatum**, *DC.*—F.B.I., ii. p. 170 ; Prain, Journ. As. Soc. Beng., lxvi. p. 400. *D. polycarpum*, Williams, Bull. Herb. Boiss., v. (1905) p. 20 e.p. *non* DC.
Bangkok, *Zimmermann*, 57.
*Distr.* Ceylon, Burma, Malaya, Philippines.

**Desmodium cephalotes**, *Wall.*, var. **typica**, *Prain*, Journ. As. Soc. Beng., lxvi. p. 389. *D. cephalotes*, Wall.—F.B.I., ii. p. 163 e.p.
*Siam Forest Service*, 117.
*Distr.* India (rare), Burma, China, Tonkin, Java.

**Desmodium Griffithianum**, *Benth.*—F.B.I., ii. p. 171 ; Prain, Journ. As. Soc. Beng., lxvi. p. 400.
Chiengmai, 800 m., *Hosseus*, 253.
*Distr.* Khasia, Burma.

**Desmodium gyrans**, *DC.*—F.B.I., ii. p. 174.
Chiengmai, in eng jungle on Doi Sootep, 300–540 m., *Kerr*, 816 ; Kan Phra Dang, *Hosseus*, 156.
*Distr.* India, Burma, China, Malay Archipelago, Philippines.

**Desmodium gyroides**, *DC.*—F.B.I., ii. p. 175 ; Prain, Journ. As. Soc. Beng., lxvi. p. 401.
Chiengmai, Doi Sootep, 720 m., *Kerr*, 745.
*Distr.* India, throughout Indo-China, Malaya.

**Desmodium insigne**, *Prain*, Journ. As. Soc. Beng., lxvi. p. 398.
Wang Djao, *Hosseus*, 61.
*Distr.* Tenasserim.

**Desmodium Kurzii**, *Craib*, nom. nov. *D. grande*, Kurz—F.B.I., ii. p. 162 ; For. Fl. Burma, i. p. 384 ; Prain, Journ. As. Soc. Beng., lxvi. p. 389, *non* E. Mey.
Chiengmai, in deciduous jungle on Doi Sootep, 300 m., *Kerr*, 766.
*Distr.* Burma.

**Desmodium laxiflorum**, *DC.*—F.B.I., ii. p. 164.
Wang Djao, *Hosseus*, 95.
*Distr.* Himalayas, Assam, Burma, China, Malay Archipelago, Philippines.

* **Desmodium longipes**, *Craib*, Kew Bull., 1910 p. 20. *D. elegans*, Drake, Journ. de Bot., v. p. 189, *non* Benth.
Chiengmai, in mixed jungle on Doi Sootep, 300 m., *Kerr*, 715.
*Distr.* Tonkin, Cambodia.

**Desmodium oblatum**, *Baker*—F.B.I., ii. p. 166 ; Prain, Journ. As. Soc. Beng., lxvi. p. 394.
Chiengmai, Doi Sootep, 1000–1020 m., *Kerr*, 873, *Hosseus*, 234.
*Distr.* Burma.

**Desmodium oblongum**, *Wall.*—F.B.I., ii. p. 166 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 43 ; Prain, Journ. As. Soc. Beng., lxvi. p. 394.
Chiengmai, Doi Sootep, 510–1500 m., *Kerr*, 877, 894, *Hosseus*, 258 ; Kan Phra Dang, *Hosseus*, 154.
*Distr.* Burma, Manipur, Yunnan.

**Desmodium polycarpum**, *DC.*—F.B.I., ii. p. 171 ; Prain, Journ. As. Soc. Beng., lxvi. p. 400.
Chiengmai, in deciduous jungle on Doi Sootep, 720 m., *Kerr*, 729 ; Wang Djao, *Hosseus*, 128.
*Distr.* India, China, throughout Indo-China, Malaya, Africa.

**Desmodium polycarpum**, *DC.*, var. **angustfolia**, *Benth. MSS.*
Chiengmai, in eng jungle on Doi Sootep, 600 m., *Kerr*, 772.
*Distr.* Tavoy (*Wall. Cat.* 5729 K in Herb. Kew).

**Desmodium pulchellum**, *Benth.*—F.B.I., ii. p. 162 ; For. Fl. Burma, i. p. 383.
Wang Djao, *Hosseus*, 66.
*Distr.* E. Asia.

**Desmodium sambuense**, *DC.*—Prain, Journ. As. Soc. Beng., lxvi. p. 394. *D. floribundum*, Don—F.B.I., ii. p. 167 ; For. Fl. Burma, i. p. 387 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 43.
Chiengmai, in open grassy jungle on Doi Sootep, 1200–1350 m., *Kerr*, 782.
*Distr.* Punjab to Khasia, Upper Burma, China.

**Desmodium trichocaulon**, *DC.* *D. polycarpum*, DC., var. *trichocaulon*, Baker, F.B.I., ii. p. 172.
Chiengmai, in open grassy jungle on Doi Sootep, 1350 m., *Kerr*, 1308.
*Distr.* E. Himalayas, Khasia, Burma.

**Desmodium triflorum**, *DC.*—F.B.I., ii. p. 173 ; Prain, Journ. As. Soc. Beng., lxvi. p. 401.
Chiengmai, in a clearing on Doi Sootep, 720 m., *Kerr*, 794.
*Distr.* Tropics.

**Uraria lagopoides**, *DC.*—F.B.I., ii. p. 156 ; Prain, Journ. As. Soc. Beng., lxvi. p. 380.
Chiengmai, Doi Sootep, 390 m., *Kerr*, 650.
*Distr.* Bengal and Assam to S. China, Tonkin, Malaya.

**Uraria latifolia**, *Prain*, Journ. As. Soc. Beng., lxvi. p. 383.
Chiengmai, deciduous jungle on Doi Sootep, 420 m., *Kerr*, 1275.
*Distr.* Upper Burma.

**Uraria macrostachya**, *Wall.*—Prain, Journ. As. Soc. Beng., lxvi. p. 380.
Chiengmai, scrub jungle on Doi Sootep, 330 m., *Kerr*, 1330.
*Distr.* Burma, China.

**Phylacium majus**, *Coll. et Hemsl.*, Journ. Linn. Soc., xxviii. p. 44, cum tab. ; Prain, Journ. As. Soc. Beng., lxvi. p. 387.
Chiengmai, by a stream on Doi Sootep, 540 m., *Kerr*, 925.
*Distr.* Upper Burma.

**Alysicarpus bupleurifolius**, *DC.*—F.B.I., ii. p. 158.

Chiengmai, in eng jungle on Doi Sootep, 300–450 m., *Kerr*, 808 ; Wang Djao, *Hosseus*, 108 ; Ban Tang, *Hosseus*, 703.
*Distr.* Tropical Asia and Africa.

**Lespedeza parviflora**, *Kurz*, For. Fl. Burma, i. p. 381 ; F.B.I., ii. p. 144 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 45.
Chiengmai, Doi Sootep, 300–1500 m., *Kerr*, 951, *Hosseus*, 288.
*Distr.* Upper Burma.

**Abrus cantoniensis**, *Hance*, var. **Hossei**, *Craib*, var. nov., a typo foliolis rigidioribus numerosioribus utrinque usque ad 15, legumine paulo latiore, apice vix tam obliquo distinguenda.
Kan Phra Dang, 320 m., *Hosseus*, 155.
This plant has not as yet been collected by Dr. Kerr, and although the single specimen preserved in Herb. Kew differs from typical *A. cantoniensis* in the points noted, a more complete set of specimens is necessary to form a definite opinion as to its exact relationship to *A. cantoniensis*.
There is another species of *Abrus* (?) represented at Kew collected by Dr. Kerr at Chiengmai (No. 588), and again by the officers of the Siamese Forestry Department (No. 157), which is quite distinct, most notably in its leaflets, which are large for the genus, but in the absence of fruit I hesitate to refer it definitely to this genus.

**Clitoria macrophylla**, *Wall.*—F.B.I., ii. p. 209.
Chiengmai, in deciduous jungle on Doi Sootep, 390 m., *Kerr*, 645.
*Distr.* Burma.

**Clitoria mariana**, *Linn.*—F.B.I., ii. p. 208.
Chiengmai, Doi Sootep, 1200–1650 m., *Kerr*, 671.
*Distr.* Khasia, Burma, Yunnan, America.

**Clitoria ternatea**, *Linn.*—F.B.I., ii. p. 208 ; Williams, Bull. Herb. Boiss., v. (1905) p. 21.
Bangkok, *Zimmermann*, 5, 15, 156.
*Distr.* Tropics.

**Dumasia villosa**, *DC.*, var. **leiocarpa**, *Baker*, F.B.I., ii. p. 183 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 47.
Chiengmai, Doi Sootep, 1200–1650 m., *Kerr*, 883, *Hosseus*, 205.
*Distr.* Sikkim, Khasia, Burma, Ceylon.

**Shuteria hirsuta**, *Baker*, F.B.I., ii. p. 182 ; Prain, Journ. As. Soc. Beng., lxvi. p. 402 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 47. *Pueraria anabaptista*, Kurz.
Chiengmai, Doi Sootep, 1000 m., *Hosseus*, 232 ; Ban Meh Tah, 300 m., *Kerr*, 998 ; Raheng, *Lindhard*, 51.
*Distr.* Sikkim, Khasia, Burma, Yunnan, Sumatra.
For uniformity with F.B.I., l.c., I refer this plant to *Shuteria*, but it would probably be more satisfactory to follow Kurz, and place it in *Pueraria*.

**Erythrina lithosperma**, *Miq.*—F.B.I., ii. p. 190 ; For. Fl. Burma, i. p. 367 ; Prain, Journ. As. Soc. Beng., lxvi. p. 411.
Mountains between Lampoon and Lakon, 450 m., *Kerr*, 969 ; Doi Chieng Dao, 500 m., *Hosseus*, 419.
*Distr.* Burma, Malaya.

**Erythrina suberosa**, *Roxb.*—F.B.I., ii. p. 189 ; For. Fl. Burma, i. p. 369 ; Prain, Journ. As. Soc. Beng., lxvi., p. 410.

Near Pang Pooey, 420 m., *Kerr*, 1001.
*Distr.* India.

**Apios carnea**, *Benth.*—F.B.I., ii. p. 188 ; Prain, Journ. As. Soc. Beng., lxvi. p. 410.
Chiengmai, in evergreen jungle on Doi Sootep, 1500 m., *Kerr*, 881.
*Distr.* Nepaul, Khasia, Upper Burma (ex Prain, l.c.), (Yunnan?).

**Butea superba**, *Roxb.*—F.B.I., ii. p. 195 ; For. Fl. Burma, i. p. 365.
Lakon, Palat, 300 m., *Kerr*, 1009.
*Distr.* Bengal, Burma.
Lao name, Mai Kwou Krena.

**Spatholobus Roxburghii**, *Benth.*—F.B.I., ii. p. 193 ; Prain, Journ. As. Soc. Beng., lxvi. p. 412. *Butea parviflora*, Roxb.—For. Fl. Burma, i. p. 365.
Chiengmai, in eng jungle on Doi Sootep, 450 m., *Kerr*, 723.
*Distr.* India, Burma, Assam, Yunnan.

**Grona Grahami**, *Benth.*—F.B.I., ii. p. 191 ; Prain, Journ. As. Soc. Beng., lxvi. p. 411.
Chiengmai, in eng jungle on Doi Sootep, 300–600 m., *Kerr*, 837.
*Distr.* Bengal (ex Prain, l.c.), Burma.

* **Pueraria alopecuroides**, *Craib*, Kew Bull. 1910, p. 276.
Hills between Muang Prow and Chieng Dao, 600 m., *Kerr*, 1044.
*Distr.* Yunnan, Upper Burma.
According to Dr. Kerr, the standard is white, with a yellow spot at the base, and the keel is purple.

**Pueraria Candollei**, *Grah.*—F.B.I., ii. p. 197 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 47 ; Prain, Journ. As. Soc. Beng., lxvi. p. 419.
Near Muang Prow, 300 m., *Kerr*, 992.
*Distr.* Andaman Is. (ex Prain, l.c.), Burma.

**Pueraria siamica**, *Craib*, sp. n., ab affini *P. Collettii*, Prain, foliolis acuminatis acutis, stipellis duplo longioribus, racemis gracilioribus longioribus haud tam densis, pedicellis sub anthesin gracilibus calyce longioribus distincta.
*Herba* scandens ; ramuli 3 mm. diametro, molliter albo-tomentelli. *Folia* pinnatim trifoliolata ; petioli 4–7 cm. longi, supra canaliculati, indumento ut in ramulis ; foliola ovata, apice acuminata acuta, basi terminalia cuneata, lateralia obliqua rotundata, 9–14 cm. longa, 4–6·5 cm. lata, margine integro, chartacea, supra hispidula, subtus molliter pubescentia, nervis lateralibus utrinque 5–6 cum nervulis supra conspicuis subtus prominentibus ; petioluli ad 4 mm. longi ; foliola terminalia a lateralibus 2–3·2 cm. distantia ; stipellae ad 6 mm. longae. *Racemi* solitarii axillares vel ad apices ramulorum paniculati, graciles, ad 32 cm. longi, nodis basalibus 2·5–3·5 cm., intermediis ad 1·5 cm. distantibus ; bracteae lanceolatae, acutae, 2 mm. longae ; pedicelli graciles ad 3·5 mm. longi. *Calycis* lobi 1 mm. longi, duo supremi in unum connati, tubus 2 mm. longus. *Corolla* purpurea, longe exserta ; vexillum amplum, reflexum, emarginatum, basi auriculatum, 4·5 mm. longum, 6 mm. latum, ungui circiter 2 mm. longo ; alae oblongo-obovatae, basi appendiculatae, 5·5 mm. longae, 2·5 mm. latae, ungui 2·5 mm. longo ; carina obtusa, 4 mm. longa, 2 mm. lata, ungui 2·5 mm. longo. *Stamen* vexillare

ima basi liberum, medio cum ceteris connatum ; antherae uniformes. *Ovarium* 3 mm. altum, 9 ovulatum, stylo glabro.
Chiengmai, Doi Sootep, 720 m., *Kerr*, 831.

**Pueraria Wallichii**, *DC.*—F.B.I., ii. p. 197 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 47 ; Prain, Journ. As. Soc. Beng., lxvi. p. 419.
Chiengmai, Doi Sootep, 1000–1700 m., *Kerr*, 878, *Hosseus*, 207.
*Distr.* E. Himalayas, Burma, Yunnan.

**Cruddasia insignis**, *Prain*, Journ. As. Soc. Beng., lxvii. p. 287.
Chiengmai, in open jungle on top of Doi Sootep, 1500–1650 m., *Kerr*, 727.
*Distr.* Upper Burma.

**Dysolobium dolichoides**, *Prain*, Journ. As. Soc. Beng., lxvi. p. 427 ? *Vigna dolichoides*, Baker, F.B.I., ii. p. 206. *Vigna vexillata*, Williams, Bull. Herb. Boiss., v. (1905) p. 22, *non* Benth.
Bangkok, *Schomburgk*, 300.
*Distr.* Bengal, Assam, Burma.
Schomburgk's plant differs from the specimens in Herb. Kew referred to this species in having the leaflets occasionally trilobed—a not uncommon occurrence in this section of the *Phaseoleae*. There is no trace on the herbarium sheet of the name *Pueraria phaseoloides*, which, according to Williams, l.c., had been erroneously given to this plant, but in any case the name he suggests is also applicable.

**Dolichos falcatus**, *Klein* ?—F.B.I., ii. p. 211 ; Prain, Journ. As. Soc. Beng., lxvi. p. 430.
Chiengmai, in eng jungle, 540 m., *Kerr*, 834 ; Wang Djao, *Hosseus*, 45.
*Distr.* India, Burma, China.

**Dunbaria fusca**, *Kurz*—Prain, Journ. As. Soc. Beng., lxvi. p. 434. *Phaseolus fuscus*, Wall.—F.B.I., ii. p. 204.
Chiengmai, Doi Sootep, 900 m., *Kerr*, 813.
*Distr.* Upper Burma, China.

* **Dunbaria longeracemosa**, *Craib*, Kew Bull. 1910, p. 277.
Chiengmai, Doi Sootep, *Kerr*, 917 ; Kan Phra Dang, *Hosseus*, 148.

**Dunbaria podocarpa**, *Kurz*—F.B.I., ii. p. 218. *Vigna retusa*, Williams, Bull. Herb. Boiss., v. (1905) p. 21, ?, *non* Walp.
Chiengmai, evergreen jungle on Doi Sootep, 750–1050 m., *Kerr*, 870 ; Nakontai, 600 m., *Hosseus*, 717 ; Siam (?), *Candler*.
*Distr.* Burma, China.
As this is the only plant belonging to this section collected by Candler, it may be the plant enumerated by Williams, l.c., as *Vigna retusa*. There is, however, no evidence on the sheet of the plant having been seen by Williams.

**Atylosia barbata**, *Baker*, F.B.I., ii. p. 216 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 48.
Doi Chieng Dao, 450 m., *Kerr*, 1050.
*Distr.* Throughout Indo-China, Malaya.

**Atylosia crassa**, *Prain*, Journ. As. Soc. Beng., lxvi. p. 45. *A. mollis*, Benth.—F.B.I., ii. p. 213 e.p. ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 48.

Chiengmai, mixed jungle on Doi Sootep, 330 m., *Kerr*, 945 ; Ban Djam, 360 m., *Hosseus*, 368.

*Distr.* India to foot of Himalayas, Burma, Assam, Tonkin, Java, Philippines.

**Rhynchosia longipetiolata**, *Hosseus*, Fedde Repert. Nov. Sp., iv. p. 291.

Kan Phra Dang, *Hosseus*, 150.

**Eriosema chinense**, *Vogel*—F.B.I., ii. p. 219 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 49.

Chiengmai, in eng jungle on Doi Sootep, 450 m., *Kerr*, 722.

*Distr.* S.E. Asia, Australia.

**Flemingia bracteata**, *Wight*—For. Fl. Burma, i. p. 372 ; Prain, Journ. As. Soc. Beng., lxvi. p. 437. *F. strobilifera*, var. *bracteata*, Baker, F.B.I., ii. p. 227.

Piang Pooey, 420 m., *Kerr*, 981.

*Distr.* India, Burma, Yunnan.

**Flemingia Chappar**, *Ham.*—F.B.I., ii. p. 227 ; For. Fl. Burma, i. p. 371.

Ban Meh Chang, 300 m., *Kerr*, 980.

*Distr.* Bengal, Burma.

**Flemingia ferruginea**, *Ham.*—Prain, Journ. As. Soc. Beng., lxvi. p. 440. *F. congesta* Roxb., var. *Wightiana*, Baker, F.B.I., ii. p. 229, p.p.

Banks of Meh Ping, opposite Ban Salu, *Hosseus*, 381.

*Distr.* Burma.

**Flemingia Kerrii**, *Craib*, sp. n., affinis *F. congestae*, Roxb., sed bracteis parvis, floribus haud tam congestis, calycis brevioris indumento parciore, eiusque lobis supremis alte connatis, corolla longe exserta, legumine minore distincta.

*Fruticulus* 1·5 m. altus (*ex Kerr*) ; ramuli primo sub-triangulares mox teretes, glabrescentes, cortice rubro-brunneo striato obtecti. *Folia* trifoliolata ; petioli 3–5 cm. longi, alati, parce pilosi ; stipulae subpersistentes, lineari-lanceolatae, acuminatae, acutae, 8 mm. longae, 2 mm. latae ; foliola elliptica vel oblongo-elliptica, apice acuminata, mucronata, basi terminalia cuneata, lateralia obliqua subrotundata, 6–10 cm. longa, 2·5–5 cm. lata, margine integro, chartacea, supra breviter puberula subtus nervis pilulosa, nervis lateralibus utrinque circiter 7 [pseudo-trinervia ob nervos basales valde obliquos], supra conspicuis subtus cum nervulis prominulis ; petioluli vix 5 mm. longi, brunneo-tomentelli. *Racemi* 1·5–3 cm. longi ; bracteae parvae, ovatae, acutae, vix 2 mm. longae. *Calyx* extus breviter sericeus, intus lobis praecipue imperfecte sericeus praetereaque extus loborum margines versus dense rubro-glandulosus ; tubus 1·75 mm. longus ; lobus infimus 4 mm. longus, lobi laterales 2·5 mm. longi, duo supremi in unum apice bifidum connati, omnes lanceolati vel late lanceolati, acuti. *Corolla* purpurea ; vexillum obovato-ellipticum, apice brevissime obtuseque acuminatum, basi appendiculatum, 7 mm. longum, 4 mm. latum, ungui circiter 1·5 mm. longo ; alae anguste oblongae, basi breviter appendiculatae, 5 mm. longae, 1·5 mm. latae, ungui 2 mm. longo ; carina obtusa, basi truncata, 5 mm. longa, 2·5 mm. lata, ungui 2·5 mm. longo. *Ovarium* vix 2 mm. altum,

stylo superne glabro. *Legumen* 1 cm. longum, 0·5 cm. diametro, puberulum.

Near Laken, in dry stream bed, 300 m., *Kerr*, 976.

**Flemingia sootepensis**, *Craib*, sp. n., affinis *F. semialatae*, Roxb., a qua racemis quam foliis brevioribus, calycis indumento breviore, lobis valde brevioribus, leguminibus oblongis angustioribus recedit.

*Fruticulus* vix 1 m. altus (*ex Kerr*); ramuli primo triangulares appresse brunneo-pubescentes mox fere glabri, cortice rubro-brunneo lenticellato obtecti. *Folia* trifoliolata; petioli 3–7 cm. longi, alati, glabrescentes; stipulae lineari-lanceolatae, acuminatae, acutae, 2 cm. longae, 3 mm. latae, caducae; foliola plerumque lanceolata, apice acuminata, mucronata, basi terminalia cuneata, lateralia obliqua rotundata, ad 19 cm. longa, 6·5 cm. lata, margine integro, chartacea, supra glabrescentia, subtus nervis puberula, nervis lateralibus utrinque circiter 6 supra conspicuis subtus prominulis; petioluli 3–5 mm. longi, fulvo-hirsuti. *Racemi* 2–10 cm. longi; bracteae ovato-lanceolatae, acuminatae, ad 6 mm. longae, 2 mm. latae. *Calyx* pilulosus, distincte nervatus; tubus 3 mm. longus; lobi lineari-lanceolati, acutissimi, laterales supremique 4 mm. longi, infimus paulo longior. *Corolla* alba; vexillum late ellipticum, basi auriculatum, 6 mm. longum, 4 mm. latum, ungui 2·5 mm. longo; alae oblongae, appendiculatae, 5 mm. longae, 1·5 mm. latae, ungui gracili circiter 3 mm. longo; carina obtusa, haud appendiculata, 5·75 mm. longa, 1·5 mm. lata, ungui gracili, 3 mm. longo. *Ovarium* vix 2 mm. altum. *Legumen* oblongum, styli basi persistente apiculatum, 1·3 cm. longum, 6 mm. latum.

Chiengmai, in evergreen jungle on Doi Sootep, 600–900 m., *Kerr*, 934, *Hosseus*, 309.

The nervation of the calyx tube is scarcely so distinct in the specimen collected by Hosseus as in that collected by Kerr and the racemes are slightly longer but it apparently belongs to this species.

**Dalbergia cultrata**, *Grah.*—F.B.I., ii. p. 233; For. Fl. Burma, i. p. 342; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 50; Prain, Ann. Roy. Bot. Gard. Calc., x. p. 55.

Chiengmai, Doi Sootep, 450 m., *Kerr*, 1075.

*Distr.* Burma.

**Dalbergia Kerrii**, *Craib*, sp. n., e grege *Canarum* affinis *D. Kurzii*, Prain, a qua foliolis formae diversae numerosioribus, stipulis magnis, legumine haud glabro vix reticulato differt.

*Arbor* ad 15 m. alta (*ex Kerr*); ramuli ad 7 mm. diametro, juventute fulvo-tomentelli, mox glabri, cortice striato vel irregulariter fisso obtecti. *Folia* pinnata, ad 16·5 cm. longa, rachi fulvo-tomentello; petioli 5 cm. longi; stipulae deciduae, lanceolatae, apice acutae, 14 mm. longae, 5 mm. latae. *Foliola* 15, oblonga, elliptica vel obovato-elliptica, apice breviter acuminata, obtusa, basi rotundata vel cuneata, 2–7 cm. longa, 1·4–2·3 cm. lata, chartacea, margine integra, ciliolata, supra glabra nisi nervis glabrescentibus, subtus fere glabra costa fulvo-tomentella excepta, nervis lateralibus utrinque circiter 7 intra marginem arcuatis utrinque conspicuis, nervis transversis uti reticulatione gracili subtus conspicuis. *Inflorescentia* ante folia evoluta, ex axillis veteribus, paniculis ad 11 cm. longis 17 cm. latis.

*Pedunculi* fulvo-tomentelli ; pedicelli graciles, circiter 3 mm. longi. *Calyx* campanulatus, 4 mm. longus, 4 mm. diametro, extra fere glaber ; dentes subaequales circiter 1·5 mm. longi, obtusi. *Corolla* longe exserta, glabra ; vexillum late ellipticum, apice emarginatum, basi cuneatum, reflexum, 6·5 mm. longum, 3 mm. latum ; alae oblongae, apice obtusae, basi hastatae, 4 mm. longae, 2 mm. latae, ungui 2 mm. longo ; carina alis subaequalis, basi hastata, ungui 2 mm. longo. *Ovarium* 3 mm. altum, 1 mm. latum, sparse pubescens, stipite 2·5 mm. longo, uniovulatum ; stylus subulatus 1·75 mm. longus, basi vix glaber. *Legumen* late ligulatum, apice rotundatum, apiculatum, basi cuneatum, 7–8 cm. longum, 2·2 cm. latum, breviter molliterque pubescens, haud conspicue reticulatum, stipite 5 mm. longo ut in legumine pubescente.

Muang Prow, Meh Kaut, 450 m., *Kerr*, 1033.

Lao name, Mai Ket.

Dalbergia rimosa, *Roxb.*—F.B.I., ii. p. 232 ; Prain, Ann. Roy. Bot. Gard. Calc., x. p. 38.

Chiengmai, Doi Sootep, 750 m., *Kerr*, 1096.

*Distr.* Sikkim, Assam, Burma, Yunnan, Tonkin.

Dalbergia stipulacea, *Roxb.*—F.B.I., ii. p. 237 p.p. ; For. Fl. Burma, i. p. 346 ; Prain, Ann. Roy. Bot. Gard. Calc., x. p. 102.

Chiengmai, Doi Sootep, 660–900 m., *Kerr*, 560, 1175.

*Distr.* Sikkim, Assam, Burma, Yunnan.

Dalbergia tamarindifolia, *Roxb.*—F.B.I., ii. p. 234 ; For. Fl. Burma, i. p. 348 ; Prain, Ann. Roy. Bot. Gard. Calc., x. p. 69.

Lem Tong Lan, *Murton*, 124.

*Distr.* India, Burma, China, Malaya, Philippines.

Dalbergia volubilis, *Roxb.*—F.B.I., ii. p. 235 ; For. Fl. Burma, i. p. 346 ; Prain, Ann. Roy. Bot. Gard. Calc., x. p. 100.

Lakon, Hooey Meh Tan, 360 m., *Kerr*, 1014.

*Distr.* India, Burma, Assam.

Lao name, Pi Pohng.

Pterocarpus macrocarpus, *Kurz*—F.B.I., ii. p. 239 ; For. Fl. Burma, i. p. 349.

Korat, 600–900 m., *Witt.*

*Distr.* Burma.

Vern. Mai Padouk (ex *Witt*).

Derris robusta, *Benth.*—F.B.I., ii. p. 241 ; For. Fl. Burma, i. p. 338 ; Prain, Journ. As. Soc. Beng., lxvi. p. 458.

Doi Chieng Dao, 350 m., *Hosseus*, 523.

*Distr.* India, Burma, Yunnan.

Caesalpinia digyna, *Rottl.*—F.B.I., ii. p. 256 ; For. Fl. Burma, i. p. 407 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 51 ; Williams, Bull. Herb. Boiss., v. (1905) p. 19.

Chiengmai, in scrub jungle on Doi Sootep, 300 m., *Kerr*, 806.

*Distr.* India, Malaya.

Caesalpinia minax, *Hance*, var. burmanica, *Prain*, Journ. As. Soc. Beng., lxvi. p. 469. *C. Morsei*, Dunn, Journ. Linn. Soc., xxxv. p. 492.

Chiengmai, in scrub jungle on banks of Meh Ping, 300 m., *Kerr*, 758.

*Distr.* Burma, China, Tonkin.

**Caesalpinia Sappan**, *Linn.*—F.B.I., ii. p. 255 ; For. Fl. Burma, i. p. 405 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 51.
Chiengmai, Doi Sootep, 330 m., *Kerr*, 1262.
*Distr.* S.E. Asia.

**Cassia alata**, *Linn.*—F.B.I., ii. p. 264.
Bangkok, *Zimmermann*, 26.
*Distr.* Tropics.

**Cassia Bakeriana**, *Craib*, sp. n., a *C. nodosa*, Ham., calyce corollaque multo majoribus, a *C. javanica*, Linn., foliolorum magnitudine et forma, ab ambabus indumento recedit.
*Folia* 35·5 cm. longa, petiolo fulvo-puberulo tereti 4 cm. longo suffulta ; foliola utrinque 10, oblonga vel terminalia oblanceolata, apice acuta vel breviter acuminata, basi obliqua, cuneata, 6·3–8·5 cm. longa, 1·7–3 cm. lata, subchartacea, utrinque, subtus costa nervisque praecipue, densius pilulosa, nervis lateralibus utrinque circiter 10, supra vix conspicuis subtus prominulis, costa supra sicco impressa ; petioluli 2 mm. longi. *Racemi* laterales (?), 4·5–7·5 cm. longi ; bracteae sub anthesin conspicuae, lanceolatae, apice acutae, ad 1 cm. longae, 3 mm. latae, utrinque pilulosae. *Pedicelli* 6 cm. attingentes, sulcati, pilulosi. *Calycis* lobi lanceolati vel ovato-lanceolati, obtusiusculi, 0·9–1·2 cm. longi, 2–3 mm. lati, utrinque ut in bracteis pilulosi. *Petala* subaequalia, lanceolata, oblongo-lanceolata vel ovato-lanceolata, acutiuscula, 3·5–4·5 cm. longa, 1·2–2·5 cm. lata, utrinque pilulosa, basi in unguem 0·5 cm. longum contracta. *Stamina* omnia fertilia, 3 alia longe superantia eorumque filamentis medio incrassatis, filamentis glabris. *Ovarium* longe stipitatum, arcuatum, albo-pubescens, stylo brevi apice incurvo.
Chiengmai, Doi Sootep, 1000–1500 m., *Hosseus*, 478.
To this species probably belongs Griffith's Prome Hill specimen (Kew Distr., 1909) mentioned in Flora of British India by Mr. Baker as a variety of *C. javanica* or a new species.

**Cassia Fistula**, *Linn.*—F.B.I., ii. p. 261 ; For. Fl. Burma, i. p. 391 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 51.
Chiengmai, Doi Sootep, 660 m., *Kerr*, 1194 ; Bangkok, *Zimmermann*, 60.
*Distr.* India, China, Malaya—often planted in Tropics.

**Cassia glauca**, *Lamk.*—F.B.I., ii. p. 265.
Raheng, *Hosseus*, 170.
*Distr.* S. E. Asia—often planted.

**Cassia Leschenaultiana**, *DC.*—Prain, Journ. As. Soc. Beng., lxvi. p. 477. *C. mimosoides*, Linn., var. *Wallichii*, Baker, F.B.I., ii. p. 266.
Chiengmai, *Hosseus*, 257.
*Distr.* India, Burma, Malaya.

**Cassia mimosoides**, *Linn.*—F.B.I., ii. p. 266 ; Prain, Journ. As. Soc. Beng., lxvi. p. 477.
Wang Djao, *Hosseus*, 129.
*Distr.* S.E. Asia.

**Cassia occidentalis**, *Linn.*—F.B.I., ii. p. 262 ; Prain, Journ. As. Soc. Beng., lxvi. p. 474 ; Williams, Bull. Herb. Boiss., v. (1905) p. 19.

Chiengmai, on waste ground, 300 m., *Kerr*, 759.
*Distr.* Tropics.

**Cassia pumila**, *Lamk.*—F.B.I., ii. p. 266.
Chiengmai, in deciduous jungle on Doi Sootep, 300 m., *Kerr*, 840.
*Distr.* Tropical Asia, N. Australia.

**Cassia siamea**, *Lamk.*—F.B.I., ii. p. 264 ; Williams, Bull. Herb. Boiss., v. (1905) p. 19.
*Siam Forest Service*, 135 ; Ban Takilek, 300 m., *Hosseus*, 321.
*Distr.* India, Malaya.
Hosseus 321 in Herb. Kew consists of leaves only but is apparently this species.

**Cassia Sophera**, *Linn.*—F.B.I., ii. p. 262.
Bangkok, *Zimmermann*, 14.
*Distr.* Tropics.

**Cassia timoriensis**, *DC.*—F.B.I., ii. p. 265 ; For. Fl. Burma, i. p. 393.
Chiengmai, in scrub jungle on Doi Sootep, 300 m., *Kerr*, 797 ; Wang Djao, *Hosseus*, 86.
*Distr.* India, throughout Indo-China, Malaya.

**Cassia Tora**, *Linn.*—F.B.I., ii. p. 263 e.p. ; Prain, Journ. As. Soc. Beng., lxvi. p. 475.
Chiengmai, on waste ground, 300 m., *Kerr*, 807 ; Raheng, *Hosseus*, 169 ; Bangkok, *Zimmermann*, 13.
*Distr.* S. E. Asia.

**Bauhinia acuminata**, *Linn.*—F.B.I., ii. p. 276 ; For. Fl. Burma, i. p. 397 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 51.
Chiengmai, mixed jungle on Doi Sootep, 300 m., *Kerr*, 610 ; Bangkok, *Zimmermann*, 144.
*Distr.* India, Burma, China, Malaya.

**Bauhinia Blancoi**, *Baker*, F.B.I., ii. p. 278. *B. coccinea*, Williams, Bull. Herb. Boiss., v. (1905) p. 18, *non* DC.
Anhin, *Schomburgk*, 286.
*Distr.* Philippines, Malay Archipelago.

**Bauhinia bracteata**, *Grah.*—F.B.I., ii. p. 282.
Gulf of Siam, *Finlayson* in Wall. Cat. 5802 in Herb. Kew.
*Distr.* Tenasserim.

**Bauhinia Harmsiana**, *Hosseus*, Fedde Repert. Nov. Sp., iv. (1907) p. 290.
Banks of Meh Ping Rapids up to Chiengmai, 135–300 m., *Kerr*, 507.

**Bauhinia polycarpa**, *Wall.*—For. Fl. Burma, i. p. 397 ; F.B.I., ii. p. 276 ; Prain, Journ. As. Soc. Beng., lxvi. p. 495. *B. baviensis*, Drake, Journ. de Bot., v. p. 217.
Chiengmai, mixed jungle on Doi Sootep, 360 m., *Kerr*, 1247 ; *Siam Forest Service*, 136.
*Distr.* Burma, Tonkin.
Kerr remarks that the flowers are pale green.

**Bauhinia purpurea**, *Linn.*—F.B.I., ii. p. 284 ; For. Fl. Burma, i. p. 398.

Raheng, 120 m., *Kerr*, 914 ; Salween, Mg. Youam, *Witt* ; *Siam Forest Service*, 137.

*Distr.* India, Burma, China, Singapore,—often cultivated.

**Bauhinia unguiculata**, *Baker*, F.B.I., ii. p. 277.

Anhin, *Schomburgk*, 241.

**Bauhinia variegata**, *Linn.*—F.B.I., ii. p. 284 ; For. Fl. Burma, i. p. 397 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 51.

Chiengmai, Doi Sootep, 330–360 m., *Kerr*, 525 ; Doi Chieng Dao, *Hosseus*, 407, 471.

*Distr.* India, Burma, China.

**Afzelia siamica**, *Craib*, sp. n., a speciebus indicis adhuc descriptis foliolis usque 5-jugis, staminibus 7, floribus majusculis recedit.

*Arbor* alta, ramis patentibus, ramulis gracilibus teretibus juventute puberulis cortice viride-brunneo lenticelloso obtectis. *Folia* 16–26 cm. longa, glabra, petiolis basi incrassatis 2·5–3 cm. longis suffulta ; foliola 3–5-juga, oblonga, apice obtusa, emarginata, basi rotundata vel truncata, 4–9 cm. longa, 3·5–4·5 cm. lata, supra viridia, subtus pallidiora vel glauca, chartacea, margine integro leviter cartilagineo, nervis lateralibus utrinque numerosis, intra marginem arcuatis cum nervulis utrinque conspicuis ; petioluli 3–4 mm. longi, rugosi. *Racemi* terminales et axillares, simplices vel interdum e basi simpliciter ramosi. *Pedicelli* ad 1 cm. longi, ut in calyce bracteisque albo-tomentosi ; bracteae ovato-oblongae, apice acutiusculae, 9 mm. longae, 4 mm. latae, ante anthesin deciduae ; bracteolae bracteis similes sed tomentellae et sub anthesin subpersistentes. *Calycis* tubus superne leviter dilatatus, vix 1 cm. longus, medio 2·5 mm. diametro ; lobi 4, virides, oblongi, subaequales, usque ad 1·5 cm. longi, 1·1 cm. lati. *Petalum* unum roseum ; unguis 1 cm. longus, intus basin versus parce lanatus ; limbus subrotundatus, 9 mm. longus, 8 mm. latus, apice emarginatus, extus medio pubescens. *Stamina* 7 ; filamenta 3–3·5 cm. longa, apicem versus attenuata, basi parce pubescentia ; staminodia 3, quorum duo circiter 1 cm. longa, tertium 3 mm. longum, omnia inferne pubescentia. *Ovarium* stipitatum, suturis et stipe lanatum ; stylus glaber, vix 3 cm. longus. *Legumen* oblongum, 18 cm. longum, 7·5 cm. latum, valvis lignosis 7 mm. crassis.

Chiengmai, Ban Meh Sah, by streams, 330 m., *Kerr*, 1068.

**Sindora siamensis**, *Teysm. ex Miq.*—Prain, Journ. As. Soc. Beng., lxvi. p. 481. *S. Wallichii*, var. *siamensis*, Baker, F.B.I., ii. p. 268. *S. Wallichii*, Williams, Bull. Herb. Boiss., v. (1905) p. 18.

Korat, 60–90 m., *Witt* ; Ratbouri, *Teysmann*, 6050.

By a slip Williams, l.c., quotes the Ratbouri plant as having been collected by Dr. Wallich.

**Neptunia oleracea**, *Lour.*—F.B.I., ii. p. 285 ; Williams, Bull. Herb. Boiss., v. (1905) p. 18.

Chiengmai, 300 m., *Kerr*, 841.

*Distr.* Tropics.

Lao name, Puk Naung.

**Leucaena glauca**, *Benth.*—F.B.I., ii. p. 290 ; Williams, Bull. Herb. Boiss., v. (1905) p. 18.

Bangkok, *Zimmermann*, 166 ; Paknampo, *Witt*, 10.

*Distr.* Tropics.

* **Xylia Kerrii**, *Craib et Hutchinson*, Kew Bull., 1909, p. 357 ; Hook. Ic. Plant., tab. 2932.

Chiengmai, in deciduous jungle at foot of Doi Sootep, 330 m., *Kerr*, 547.

*Distr.* Burma.

**Acacia Catechu**, *Willd.*—F.B.I., ii. p. 295 ; For. Fl. Burma, i. p. 422 ; Prain, Journ. As. Soc. Beng., lxvi. pp. 508, 509.

Chiengmai, in scrub jungle, 300 m., *Kerr*, 1230.

Approaches the form *catechuoides* (Benth. sp.), but the calyx and corolla are never absolutely glabrous.

Lao name, Sia Siat.

**Acacia pennata**, *Willd.*, var. **arrophula**, *Baker*, F.B.I., ii. p. 297 ; Prain, Journ. As. Soc. Beng., lxvi. p. 510.

Chiengmai, foot of Doi Sootep, 300 m., *Kerr*, 720.

*Distr.* E. Himalayas, Burma.

**Albizzia Lebbek**, *Benth.*—F.B.I., ii. p. 298 ; For. Fl. Burma, i. p. 427.

Bangkok, *Zimmermann*, 157.

*Distr.* Tropics—often planted.

**Albizzia lebbekoides**, *Benth.*—Prain, Journ. As. Soc. Beng., lxvi. p. 513.

Wat Mai, *Hosseus*, 1.

*Distr.* Upper Burma, Malay Archipelago.

**Albizzia myriophylla**, *Benth.*—F.B.I., ii. p. 300 ; Prain, Journ. As. Soc. Beng., lxvi. p. 515 ; Williams, Bull. Herb. Boiss., v. (1905) p. 17. *A. procera*, Williams, Bull. Herb. Boiss., v. (1905) p. 18, *non* Benth.

Anhin, *Schomburgk*, 268.

*Distr.* India, Burma, Malay Peninsula.

**Pithecolobium angulatum**, *Benth.*—F.B.I., ii. p. 306 ; For. Fl. Burma, i. p. 430 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 54.

Doi Chieng Dao, 520 m., *Kerr*, 1052 ; Chiengmai, Doi Sootep, 720 m., *Kerr*, 1072.

*Distr.* Throughout Indo-China, Malaya.

**Pithecolobium glomeriflorum**, *Kurz*—For. Fl. Burma, i. p. 430 ; Prain, Journ. As. Soc. Beng., lxvi. p. 517. *Albizzia glomeriflora*, Kurz—F.B.I., ii. p. 300.

Chiengmai, in evergreen jungle on Doi Sootep, 1200–1600 m., *Kerr*, 561, *Hosseus*, 506.

*Distr.* Burma.

**Enterolobium Saman**, *Prain*, Journ. As. Soc. Beng., lxvi. p. 252. *Pithecolobium Saman*, Benth.

Chiengmai, planted along roads, 300 m., *Kerr*, 573.

Introduced—a native of Guiana.

## Rosaceae.

**Prunus Hosseusii**, *Diels*, Fedde Repert. Nov. Sp., iv. (1907) p. 289.

Chiengmai, Doi Sootep, 1650 m., *Hosseus*, 260.

More complete material is necessary to establish this as a species distinct from *P. Puddum*, Roxb.

Rubus ellipticus, *Smith*—F.B.I., ii. p. 336 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 54. *R. flavus*, Ham.—For. Fl. Burma, i. p. 438.

Chiengmai, Doi Sootep, 900 m., *Kerr*, 1119.

*Distr.* India, Burma, Philippines, China.

Rubus (Malachobatus) Kerrii, *Rolfe*, sp. n., ab affini *R. birmanico*, Hook. f., ramulis velutinis, stipulis floribusque minoribus recedit.

*Ramuli* petiolique velutini, aculeis sparsis brevibus uncinatis instructi. *Folia* quinque- vel obscure septem-loba, 5–8 cm. longa, 6–8 cm. lata, subcoriacea, denticulata, supra bullato-rugosa, glabra, venis hirsutis, subtus lacunoso-reticulata, griseo-tomentosa, in nervis hirsutula ; lobi deltoideo-ovati, praesertim intermedii paucidentati ; petioli 3–4 cm. longi. *Stipulae* bracteaeque ambitu oblongae, pectinatae, 0·6–1·2 cm. longae, velutinae. *Flores* in racemos breves axillares et terminales dispositi. *Pedicelli* 5 mm. longi. *Sepala* deltoideo-ovata, subobtusa, 5–6 mm. longa, velutina. *Petala* subsessilia, orbicularia vel latissime ovato-orbicularia, 4 mm. longa. *Stamina* numerosissima ; filamenta 3·5 mm. longa, glabra. *Carpella* numerosa, glabra ; styli 6–7 mm. longi, conferti, glabri.

Chiengmai, on edges of clearings on Doi Sootep, 720 m., *Kerr*, 648.

With the general facies of *R. birmanicus*, this species is very distinct in its pubescence, the texture and veining of its leaves, the shape of its stipules and bracts, and in its having smaller and more congested flowers.

## Crassulaceae.

Bryophyllum calycinum, *Salisb.*—F.B.I., ii. p. 413.

Ban Muang Gang, 300 m., *Hosseus*, 363.

*Distr.* Tropics.

## Droseraceae.

Drosera Burmanni, *Vahl*—F.B.I., ii. p. 424 ; Coll. et Hemsl. Journ. Linn. Soc., xxviii. p. 57.

Chiengmai, *Hosseus*, 320, 463, 493, *Kerr*, 575.

*Distr.* Trop. Asia, Africa, and Australia.

Drosera peltata, *Sm.*, var. lunata, *C. B. Clarke*, F.B.I., ii. p. 425

Chiengmai, Doi Sootep, 1200–1650 m., *Kerr*, 673, *Hosseus*, 535.

*Distr.* India, Burma, China, Malaya.

## Combretaceae.

Terminalia Chebula, *Retz.*—F.B.I., ii. p. 446 ; For. Fl. Burma, i. p. 456.

Chiengmai, Doi Sootep, 300–450 m., *Kerr*, 665.

*Distr.* India, Burma.

*Terminalia mucronata, *Craib et Hutchinson*, Kew Bull., 1909, p. 358.

Chiengmai, in deciduous jungle on Doi Sootep, 540 m., *Kerr*, 593.

Lao name, Mai Pooey.

**Terminalia tomentosa**, *Bedd.*—F.B.I., ii. p. 447 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 57. *T. alata*, Roth.—For. Fl. Burma, i. p. 458.

Chiengmai, in deciduous jungle on Doi Sootep, 540 m., *Kerr*, 626.

*Distr.* India, Burma.

**Calycopteris floribunda**, *Lamk.*—F.B.I., ii. p. 449 ; For. Fl. Burma, i. p. 468 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 57.

Chiengmai, Doi Sootep, 300 m., *Kerr*, 961 ; Ban Djam, 350 m., *Hosseus*, 366 ; Raheng, *Witt*, 23.

*Distr.* S. India, Burma, Assam, Malay Peninsula.

**Anogeissus acuminata**, *Wall.*, var. **lanceolata**, *C. B. Clarke*, F.B.I., ii. p. 451.

Near Lampoon, 300 m., *Kerr*, 965.

*Distr.* India, Burma.

**Combretum deciduum**, *Coll. et Hemsl.*, Journ. Linn. Soc., xxviii. p. 58. *C. ovale*, Kurz, For. Fl. Burma, i. p. 462, *non* R. Br.

Lakon, Pak Kaung Nai, 300 m., *Kerr*, 971 ; Doi Chieng Dao, 500 m., *Hosseus*, 461.

*Distr.* Burma.

**Combretum extensum**, *Roxb.*—For. Fl. Burma, i. p. 463 ; F.B.I., ii. p. 458.

Near Lampoon, in scrub jungle, 300 m., *Kerr*, 966.

*Distr.* India, Burma, Assam, Java, Philippines.

## Myrtaceae.

**Tristania rufescens**, *Hance*, Journ. Bot., v. (1876) p. 259.

Chiengmai, Doi Sootep, 390–600 m., *Kerr*, 516, *Hosseus*, 423.

*Distr.* Phu-quoc.

Lao name, Mai Kău (ex *Kerr*).

Probably only a variety of *T. burmanica*, Griff. ex Duthie.

**Psidium Guyava**, *Linn.*—For. Fl. Burma, i. p. 476 ; F.B.I., ii. p. 468.

Bangkok, *Zimmermann*, 154.

*Distr.* Naturalised throughout India and Indo-China.

**Eugenia balsamea**, *Wight*—For. Fl. Burma, i. p. 485 ; F.B.I., ii. p. 499.

Chiengmai, Doi Sootep, 720 m., *Kerr*, 920.

*Distr.* Sikkim, E. Bengal, Burma, Assam, Yunnan.

**Eugenia formosa**, *Wall.*—F.B.I., ii. p. 471 ; For. Fl. Burma, i. p. 492.

Chiengmai, Doi Sootep, 300–450 m., *Kerr*, 545.

*Distr.* Burma, Bengal.

**Eugenia fruticosa**, *Roxb.*—F.B.I., ii. p. 499 ; For. Fl. Burma, i. p. 485.

Chiengmai, in mixed jungle at foot of Doi Sootep, 300 m., *Kerr*, 625.

*Distr.* Burma, Bengal.

**Eugenia grata**, *Wight*—F.B.I., ii. p. 486 ; For. Fl. Burma, i. p. 480.

Chiengmai, Doi Sootep, 300–450 m., *Kerr*, 554.

*Distr.* Burma, Malaya, (China ?).

**Eugenia Kurzii**, *Duthie*, var. vel species nova ei valde affinis.
Chiengmai, Doi Sootep, 700–900 m., *Kerr*, 1091, *Hosseus*, 479.
These specimens appear to be intermediate between *E. Kurzii*, Duthie and *E. albiflora*, Duthie. *Zimmermann*, 160, from Bangkok, is also closely allied to these.
According to Kerr the Lao name of this plant and also of *E. fruticosa* is Mai Hah.

**Barringtonia racemosa**, *Roxb.*—F.B.I., ii. p. 507 ; For. Fl. Burma, i. p. 496.
Bangkok, *Schomburgk*, 211.
*Distr.* India, Burma, Tonkin, Cochinchina, Malaya.
By an oversight Williams, Bull. Herb. Boiss., iv. (1904) p. 1031, says that Schomburgk 211 was "not kept."

**Careya arborea**, *Roxb.*—For. Fl. Burma, i. p. 499 ; F.B.I., ii. p. 511.
Chiengmai, Doi Sootep, 660 m., *Kerr*, 1089.
*Distr.* India, Burma, Malaya.

## Melastomaceae.

**Osbeckia chinensis**, *Linn.*—F.B.I., ii. p. 515.
Chiengmai, Doi Sootep, 360–600 m., *Kerr*, 827, 1302 ; Wang Djao, *Hosseus*, 133.
*Distr.* India, China, Burma, Malaya, N. Australia.

**Osbeckia crinita**, *Benth.*—F.B.I., ii. p. 517.
Chiengmai, Doi Sootep, 1200–1700 m., *Kerr*, 879 p.p., *Hosseus*, 188.
*Distr.* Sikkim, Bhotan, Khasia, Burma.

**Osbeckia nepalensis**, *Hook.*—F.B.I., ii. p. 521.
Chiengmai, Doi Sootep, 720–1000 m., *Kerr*, 749, *Hosseus*, 270.
*Distr.* Himalaya, Burma, China.

**Osbeckia racemosa**, *Craib*, sp. n., ab affini *O. rostrata*, Don, foliis majoribus longe petiolatis, inflorescentia racemosa haud paniculata differt.
*Frutex* usque ad 1·2 m. altus ; rami tetragoni, internodiis parce appresse setulosi, nodis setosi, cortice albido. *Folia* ovato-elliptica, lanceolato-elliptica vel elliptica, apice acuta vel vix acuminata, basi plerumque rotundata vel juniora cuneata, 13–20 cm. longa, 4·2–8·5 cm. lata, membranacea, supra distanter, subtus nervis tantum breviter setulosa, margine integro setoso-ciliato, e basi 7-nervia, nervis subtus prominentibus supra leviter impressis, nervulis utrinque, subtus magis, conspicuis ; petioli sicco rubescentes, foliorum oppositorum parum inaequales, 1–4 cm. longi, supra canaliculati, ut in ramis setosi. *Racemi* terminales, ad 10 cm. longi, rachi crasso nodoso. *Bracteae* sub anthesin deciduae, alabastra obtegentes, ovatae, apice obtusae vel subacutae, 2·2–2·3 cm. longae, 12–15 mm. latae, membranaceae, ciliatae. *Flores* 5·5 cm. diametro. *Calycis* setosi tubus 1·2 cm. longus, lobi 6 mm. longi. *Petala* obcordata, 3·3 cm. longa, 3 cm. lata, minute ciliata. *Stamina* 8 ; filamenta 1·5 cm. longa, glabra ; antherae arcuatae 1·5 cm. longae. *Fructus* pedicello usque ad 3·5 mm. longo suffultus, inferne ovoideus, apice in collum attenuatus, 1·3–1·6 cm. longus, 7 mm. diametro.

Chiengmai, by streams in evergreen jungle on Doi Sootep, 540 m., *Kerr*, 836.
*Distr.* Burma ; Maymyo (*Lace*, 4123).

**Osbeckia stellata**, *Wall.*—F.B.I., ii. p. 517.
Chiengmai, Doi Sootep, 1200–1500 m., *Kerr*, 879 p.p.
*Distr.* Himalaya, Bengal.

**Osbeckia truncata**, *Don*—F.B.I., ii. p. 514.
Wang Djao, *Hosseus*, 130 ; Raheng, *Lindhard*, 23.
*Distr.* India.

* **Sonerila Kerrii**, *Craib et Stapf*, Kew Bull., 1910, p. 22.
Chiengmai, in open jungle on Doi Sootep, 1320–1500 m., *Kerr*, 705.

**Sonerila tenera**, *Royle*—F.B.I., ii. p. 530. *S. stricta*, Hook., var. *burmanica*, C. B. Clarke, F.B.I., ii. p. 530 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 59.
Chiengmai, evergreen jungle on Doi Sootep, 660–1020 m., *Kerr*, 872.
*Distr.* N.W. India, Burma, China.
Stapf (Ann. Bot., vi. p. 305) rightly reduces *S. stricta*, var. *burmanica* to *S. tenera*. The variety is in no way related to *S. stricta*, and Kerr's specimens serve to connect this variety with typical *S. tenera*, the indumentum on the calyx and branches being denser and more persistent than in the type.

**Memecylon pauciflorum**, *Bl.*—For. Fl. Burma, i. p. 514 : F.B.I., ii. p. 555.
Chiengmai, Doi Sootep, 300 m., *Kerr*, 584.
*Distr.* Bengal, Burma, Timor, Australia.

**Memecylon plebejum**, *Kurz*—For. Fl. Burma, i. p. 513 ; F.B.I. ii. p. 561.
Chiengmai, in evergreen jungle on Doi Sootep, 960 m., *Kerr*, 1213.
*Distr.* Burma.

## Lythraceae.

**Ammannia baccifera**, *Linn.*, 1a, aa, *Koehne*.
Siam, *Hosseus* (ex *Koehne*, Engl. Bot. Jahrb., xlii. Beibl. 97, p. 53).

**Rotala diversifolia**, *Koehne*, Engl. Bot. Jahrb., xli. p. 77.
Chiengmai, Doi Sootep, 750 m., *Hosseus*, 275.

**Rotala mexicana**, *Cham. et Schlech.*, var. **Chamissoana**, *Koehne*, f. **minima**, *Koehne*.
Siam, *Hosseus* (ex *Koehne*, Engl. Bot. Jahrb., xlii. Beibl. 97, p. 53).
*Distr.* E. India (ex *Koehne*).

**Rotala rotundifolia**, *Koehne*, Engl. Bot. Jahrb., i. p. 174. *Ammannia rotundifolia*, Ham.—F.B.I., ii. p. 566 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 60.
Chiengmai, Doi Sootep, 750–1050 m., *Hosseus*, 273, 491.
*Distr.* India, Burma, China, Formosa, Tonkin.

**Lagerstroemia Balansae**, *Koehne*, Engl. Bot. Jahrb., xxiii. Beibl. 57, p. 35.
Chiengmai, Doi Sootep, 300–720 m., *Kerr*, 718, 718a.
*Distr.* Tonkin.

Lao name, Mai Looey Dŏo.

The leaves of Kerr's specimens are rather broader and less acuminate than the type specimens collected by Balansa, but the flowers appear to be identical.

Lagerstroemia Hossei, *Koehne*, Engl. Bot. Jahrb., xlii. Beibl. 97, p. 50.

Near Doi Sootep, *Hosseus* (ex *Koehne* l.c.).

Lagerstroemia Collettii, *Craib*, sp. n., affinis *L. quinquevalvi*, Koehne, a qua calycis fructiferis tubo obconico haud patelliformi differt.

*Arbor* circiter 9 m. alta (*ex Kerr*). *Ramuli* ad 9 mm. diametro, minute puberuli. *Folia* ovato-lanceolata vel anguste elliptica, apice obtusa basi acuminata, 8–14 cm. longa, 3–5 cm. lata, margine integro, rigide chartacea, supra glabra, punctata, subtus pallidiora, nervis minute velutina, nervis lateralibus utrinque circiter 9 supra conspicuis subtus prominulis; petioli 5 mm. longi, velutini. *Paniculae* terminales, 20–40 cm. longae, 12–24 cm. latae, foliis interruptae, ramis dense minute velutinis. *Alabastra* apice rotundata, apiculo brevi coronata. *Calyx* extus dense cinereo-pulverulentus; tubus 6 mm. longus; lobi 7, deltoidei, acuti, 3 mm. longi, intus vix glabri; jugi in lacinias anguste lanceolatas acutas 3–4 mm. longas producti. *Petala* oblongo-obovata, 8 mm. longa, 5 mm. lata, in unguem 1 mm. longum contracta. *Stamina* ∞, filamentis usque ad 1·7 cm. longis. *Ovarium* globosum, glabrum; stylus glaber, 1·7 cm. longus. *Calyx* fructifer obconicus, lobis deciduis. *Fructus* ellipsoideus vel fere globosus, 1 cm. saltem diametiens. *L. sp.* aff. *L. piriformi*, Koehne—Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 60.

Chiengmai, in scrub jungle, 300 m., *Kerr*, 1264.

*Distr.* Burma, *Collett*, 857, *Lace*, 4192.

*L. quinquevalvis* is a very imperfectly known species in fruit only. *L. Collettii* is distinguished from it by the shape of its fruiting calyx and by its lobes being not glabrous on the inner surface.

Lagerstroemia intermedia, *Koehne*, var. oblonga, *Craib*, var. nov., a typa foliis oblongis apice truncatis vel rotundatis breviter acuminatis, nervis nervulisque supra prominulis, reticulatione haud tam tenui, alabastris floribusque paulo majoribus recedit.—*L. oblonga*, Craib MSS.

Chiengmai, in eng jungle, 300 m., *Kerr*, 578.

Lagerstroemia Loudoni, *Teysm. et Binn.*—For. Fl. Burma, i. p. 523.

Siam, *Teysmann;* Paknampo, *Witt*, 14.

Lagerstroemia macrocarpa, *Wall.*—For. Fl. Burma, i. p. 524; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 59. *L. speciosa*, Koehne, Engl. Pflanzenr., iv. 216, p. 261, p.p.

Korat, 90 m., *Witt*, 34.

*Dist.* Burma.

Vern. Mai Intanin (ex *Witt*).

Lagerstroemia tomentosa, *Presl.*—F.B.I., ii. p. 578, *excl. var.*; For. Fl. Burma, i. p. 522; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 60.

Raheng, *Witt*, 19, 20.

var. caudata, *Koehne*, Engl. Bot. Jahrb., xlii. Beibl. 97, p. 51.
Chiengmai, Doi Sootep, 1000 m., *Hosseus*, 512; Muang Fang, 1000–1600 m., *Hosseus*, 600.
*Distr.* Burma (type).

Lagerstroemia turbinata, *Koehne*, Engl. Bot. Jahrb., iv. p. 34. *L. floribunda*, Jack—F.B.I., ii. p. 577, p.p.; For. Fl. Burma, i. p. 522, p.p.; Williams, Bull. Herb. Boiss., iv. (1904) p. 1031.
Menan, *Hosseus*, 4; Anhin, *Schomburgk*, 240.
*Distr.* China, Burma, Cochinchina, Malay Peninsula.

Lagerstroemia undulata, *Koehne*, Engl. Bot. Jahrb., xlii. Beibl. 97, p. 52.
Meh Ping Rapids, 200 m., *Hosseus*, 530.

Lagerstroemia villosa, *Wall.*—For. Fl. Burma, i. p. 524; F.B.I., ii. p. 578; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 59.
Chiengmai, Doi Sootep, 300 m., *Kerr*, 1150; Muang Fang, 100 m., *Hosseus*, 616.
*Distr.* Burma.

Duabanga sonneratioides, *Ham.*—F.B.I., ii. p. 579; For. Fl. Burma, i. p. 525.
Muang Prow, Meh Kaut, 450 m., *Kerr*, 1032.
*Distr.* India, Burma, Assam, Yunnan, Tonkin.
Lao name, Tohng Teng.

## Onagraceae.

Jussiaea suffruticosa, *Linn.*—F.B.I., ii. p. 587; Williams, Bull. Herb. Boiss., iv. (1904) p. 1033.
Chiengmai, edge of paddy fields, 300 m., *Kerr*, 802.
*Distr.* Tropics.

Ludwigia prostrata, *Roxb.*—F.B.I., ii. p. 588.
Chiengmai, edge of paddy fields, 300 m., *Kerr*, 804.
*Distr.* Tropical Asia and Africa.

## Samydaceae.

Casearia flexuosa, *Craib*, sp. n., affinis *C. Lobbianae*, Turcz., a qua foliis serratis basi attenuatis, stipulis persistentibus, stylo longiore haud glabro, fructu ellipsoideo recedit.
*Fruticulus* 1·2 m. altus, ramis albescentibus puberulis, ramulis angulatis mox teretibus 1·5–2 mm. diametro flexuosis dense puberulis. *Folia* oblanceolata vel oblongo-lanceolata, apice acuminata, mucronata, basi attenuata, 3·5–13 cm. longa, 1·2–3·5 cm. lata, membranacea vel subchartacea, sparse puberula, margine serrato leviter recurvo, nervis lateralibus utrinque circiter 5 cum nervulis utrinque conspicuis; petioli usque ad 7 mm. longi; stipulae persistentes, rigidae, 2 mm. longae, 0·5 mm. latae. *Glomeruli* axillares; pedicelli breves glabri. *Sepala* 5, basi breviter connata, subaequalia, 3 mm. longa, fere 2 mm. lata, apice obtusa, fere glabra, margine ciliato. *Stamina* 10, staminodia 10 paulo superantia; filamenta staminodiis villosis basi adnata, villosa. *Pistillum* 1·5 mm. altum; ovarium stylo subaequilongum, glabrum, stylo inferne pubescente. *Fructus* pedicello 3 mm. longo, ellipsoideus, glaber, circiter 1 cm. altus, 8 mm. diametro; semina albida, nitentia, 6 mm. longa.

Chiengmai, in an overgrown old clearing on Doi Sootep, 720 m., *Kerr*, 694.

**Casearia Kerrii**, *Craib*, sp. n., a *C. tomentosa*, Roxb., cui affinis, foliis multo majoribus apice rotundatis vel obtusis interdum emarginatis, staminibus longioribus, antheris duplo majoribus, ovario superne villoso, fructu multo majore recedit.

*Arbor*, ramulis teretibus, juventute dense velutino-tomentosis, cortice rubro-brunneo striato parce lenticelloso obtectis. *Folia* obovata, obovato-elliptica vel oblonga, apice rotundata vel obtusa, interdum emarginata, basi inaequalia juventute attenuata mox rotundata vel truncata, 8–16·5 cm. longa, 4–8·5 cm. lata, subcoriacea, supra minute puberula nisi costa tomentosa, subtus costa nervisque primariis tomentosa, margine sub anthesin subintegro, fructu distincte crenato-serrato, nervis lateralibus utrinque 9–11 subtus prominentibus, supra cum nervulis prominulis; petioli ad 1 cm. longi. *Glomeruli* axillares, pluriflori; pedicelli 3–5 mm. longi, tomentelli. *Sepala* 5, basi breviter connata, subaequalia, 3–4 mm. longa, 2·5–3 mm. lata, apice obtusa, extus tomentella, margine membranaceo ciliato. *Filamenta* 2·5 mm. longa, glabra nisi basi intus puberula, staminodiis 1·5 mm. longis basi brevissime adnata. *Ovarium* 1 mm. altum, superne villosum; stylus 2 mm. longus, inferne ut in ovario villosus, stigmate capitato. *Fructus* ellipsoideus, 4 cm. longus, ± 2 cm. diametro, glaber, pedicello crasso 8 mm. longo.

Chiengmai, in deciduous eng jungle, 300 m., *Kerr*, 580.

Lao name, Ki Seua Quang.

**Homalium minutiflorum**, *Kurz*, For. Fl. Burma, i. p. 532, *ex descr.*

Chiengmai, Doi Sootep, 660 m., *Kerr*, 1138.

*Distr.* Burma (ex *Kurz*, l.c.).

This species is not represented in Herb. Kew.

## Passifloraceae.

**Passiflora lunata**, *Willd.*

Bangkok, *Zimmermann*, 53.

Native of Trop. America.

**Passiflora siamica**, *Craib*, sp. n., affinis *P. hainanensi*, Hance, sed caulibus haud glabris valde diversa.

*Herba* scandens; ramuli ad 2·5 mm. diametro, pubescentes, striati. *Folia* lanceolata vel ovato-lanceolata, apice acutiuscula, mucronata, basi rotundata, 5·2–14·5 cm. longa, 1·5–5·5 cm. lata, supra pilis basi incrassatis fere hispida, subtus, nervis praecipue, molliter pubescentia et praeterea matura glandis 10–14 in lineas duas costa parallelas et ab ea circiter 1 cm. utrinque distantes dispositis, chartacea, margine integro, nervis lateralibus utrinque circiter 5 intra marginem arcuatis cum nervis transversis supra conspicuis subtus prominulis. *Petioli* ad 1·5 cm. longi ut in rachi pubescentes, basin versus glandis duobus sessilibus instructi. *Cirrhi* plus minusve 15 cm. longi, unilateraliter pilosi, cum inflorescentia axillari orti. *Bracteae* lineares, acutae, ad 1·5 cm. longae 2·5 mm. latae, puberulae. *Sepala* 5, basi breviter connata, oblonga, obtusa, 1·5 cm. longa, 6 mm. lata, extus puberula. *Petala* 5, alba, sepalis conformia sed paulo minora et glabra. *Corona* duplex, exterior fimbriata, ad 8 mm. alta, interior dentata, plicata quam exteriore dimidio brevior. *Filamenta* 16 mm. longa,

ad medium connata, ovarium includentia, glabra ; antherae 4 mm. longae. *Ovarium* 2·5 mm. altum, hirsutum, gynophorio circiter 4 mm. longo filamentis adnato ; styli 4–5 liberi, filamentis subaequales, cum petalis filamentisque sicco sparse brunneo-picti. *Fructus* globosus, 1·5–2 cm. diametro ; semina 5 mm. longa, nigra, foveolata.

Chiengmai, Doi Sootep, 660 m., *Kerr*, 1049a ; Chieng Dao, 450–840 m., *Kerr*, 1049, 1256.

**Modecca pinnatisecta**, *Craib*, sp. n., a *M. apiculata*, Masters, cui affinis foliis pinnatim 5-sectis, glandis subtus aliter dispositis, antherarum cauda longiore, praecipue differt.

*Herba* scandens, omnino glabra. *Ramuli* cinereo-albi, sulcati, ad 1 mm. diametro. *Folia* 11–19 cm. longa, 14–24 cm. lata, pinnatim 5-secta, segmentis lanceolatis vel anguste lanceolatis, apice acutis breviter mucronatis 9–15 cm. longis 1–2 cm. latis, membranacea, margine integro, nervis lateralibus utrinque 2, nervulis plerumque patulis intra marginem distincte arcuatis, omnibus utrinque conspicuis, pagina superiore basi glandis 2 instructa, subtus glandulis 4 sinus adversus medio intra marginem et rachem ornata ; petioli 2·3–4·5 cm. longi. *Pedunculi* axillares, 6–10 cm. longi, in viticulas producti ; pedicelli graciles, ad 1 cm. longi. ♂ : *Calycis* tubus plus minusve 3 mm. longus, lobi 5, lanceolati, apice acutiusculi, 1·1 cm. longi, 2 mm. lati, 7–9-nervati ; loborum basi iisque oppositae glandae oblongae, majusculae, carnosae, apice recurvae. *Petala* 5, oblanceolata, 8·5 mm. longa, 2 mm. lata, margine fimbriato, 3-nervata. *Stamina* libera, petalis isomera ; filamenta basi leviter dilatata, 2·5 mm. longa ; antherae 3 mm. longae, cauda 3·5 mm. longa. *Ovarii* rudimentum 1 mm. altum. ♀ : *Calycis* tubus, lobi, et glandae maris sed paulo minores. *Petala* maris, nisi tantum 2·5 mm. longa, 0·5 mm. lata. *Staminodia* parva. *Ovarium* gynophorio 2 mm. longo suffultum, 4 mm. altum, 1·5 mm. diametro ; stylus circiter 1 mm. longus, ramis 3 bifidis. *Fructus* gynophorio 7 mm. longo, 5 cm. longus, exocarpio tenui rubro-brunneo.

Chiengmai, Doi Sootep, 720 m., *Kerr*, 751.

*Distr.* Burma, v.s. in Hb. Lace.

**Carica Papaya**, *Linn.*—F.B.I., ii. p. 599.

Bangkok, *Zimmermann*, 134.

Cultivated throughout India.

## Cucurbitaceae.

**Trichosanthes cucumerina**, *Linn.*—F.B.I., ii. p. 609.

Chiengmai, a common weed, 300 m., *Kerr*, 714.

*Distr.* India, Malaya, N. Australia.

**Trichosanthes multiloba**, *Miq.*—F.B.I., ii. p. 607.

Chiengmai, Doi Sootep, 720 m., *Kerr*, 653.

*Distr.* Sikkim, Khasia, Burma.

**Trichosanthes palmata**, *Roxb.*—F.B.I., ii. p. 606 ; Coll. et Hemsl, Journ. Linn. Soc., xxviii. p. 61.

Chiengmai, 300 m., *Kerr*, 1266.

*Distr.* India, Burma, Malaya, Australia.

**Momordica macrophylla**, *Gage*, Rec. Bot. Surv. Ind., iii. p. 61.

Chiengmai, in scrub jungle, 300 m., *Kerr*, 1263.

*Distr.* Burma.

Kerr's plant (♂) agrees with Lace's 3287 (♀) from Maymyo which was named *M. macrophylla* in Herb. Calc.

**Thladiantha Hookeri**, *C. B. Clarke*, F.B.I., ii. p. 631.

Chiengmai, in evergreen jungle on Doi Sootep, 720 m., *Kerr*, 662.

*Distr.* Assam.

**Zehneria umbellata**, *Thwaites*—F.B.I., ii. p. 625 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 61.

Chiengmai, Doi Sootep, 300 m., *Kerr*, 1130, 1130a.

*Distr.* Afghanistan, India, Burma, Assam, Tonkin, Java.

## Begoniaceae.

**Begonia incerta**, *Craib*, sp. n., ex affinitate *B. Kerrii*, Craib, sed floribus majoribus, ovario capsulaque haud glabris differt.

*Herba* subacaulis, 4–9 cm. alta. *Folia* solitaria vel gemina, orbicularia, apice obtusa, basi cordata, ad 2·5 cm. diametro, membranacea, utrinque brevissime, subtus parcius, pilosa, margine subintegro ; petioli 1–1·5 cm. longi, supra canaliculati, ut in foliis pilosi. *Pedunculi* simplices, ad 6·5 cm. longi, breviter pilosi. ♂ : *Sepala* 2, alba, rotundata, 7·5 mm. longa, 7 mm. lata, extus parce minute pilosa, margine ciliolato. *Petala* 2, alba, lineari-oblonga, 5 mm. longa, 1·5 mm. lata, glabra. *Filamenta* 2 mm. longa, ad medium connata, antheris parvis oblongis, connectivo haud producto. ♀ : *Perianthii* segmenta 5, alba, inaequalia, usque ad 5 mm. longa et 4 mm. lata. *Styli* 3, e basi liberi, stigmatorum ramulis 2. *Capsula* vix matura, brevissime pilosa, 8 mm. alta, 6 mm. lata, loculis 3 (?).

Meh Ping Rapids, banks of river on limestone 180 m., *Kerr*, 508.

**Begonia integrifolia**, *Dalz.*—F.B.I., ii. p. 648.

Chiengmai, Doi Sootep, 720 m., *Kerr*, 730.

*Distr.* Western Ghauts, Burma.

**Begonia Kerrii**, *Craib*, sp. n., affinis *B. parvuliflorae*, DC. a qua capsulae ala maxima breviore apice rotundata haud attenuata differt.

*Herba* acaulis, unifoliata, 4–11 cm. alta. *Folia* suborbicularia vel elliptica, apice obtusa, basi cordata, 3-7 cm. longa, 2·7–6 cm. lata, utrinque, nervis subtus densius, brevissime parcissimeque pilosa, membranacea, margine irregulariter dentata, dentibus minute denticulatis, ciliata, nervis e basi 7 utrinque conspicuis ; petioli 1·5–5·5 cm. longa, breviter pilosi. *Pedunculus* solitarius, gracilis, ad 7·5 cm. longus, saepissime simplex, interdum fere e basi furcatus, vix glaber. ♂ : *Sepala* 2, subrotundata, 7 mm. longa, 6 mm. lata, extus parce pilosa. *Petala* 2, oblanceolata, 7 mm. longa, circiter 2 mm. lata. *Filamenta* paulo ultra medium connata ; antherae obovatae, connectivo haud producto. ♀ : *Perianthii* segmenta inaequalia, ad 6 mm. longa, 5 mm. lata. *Styli* 3, e basi liberi, apice brevissime bifidi. *Capsula* glabra, alis membranaceis valde inaequalibus, nervis horizontalibus, 7 mm. alta, fere 1 cm. lata, 3-locularis, placentis bifidis.

Ban Kan, on damp limestone, *Kerr*, 508a.

**Begonia Roxburghii**, *DC.*—F.B.I., ii. p. 635.
Chiengmai, Doi Sootep, 1200 m., *Kerr*, 888.
*Distr.* Himalaya, Burma, Assam.

**Begonia sootepensis**, *Craib*, sp. n., habitu *B. yunnanensi*, Levl., similis sed altior, caule vix glabro, foliis crassioribus supra setulosis.

*Herba* erecta, ad 43 cm. alta; caulis ruber, rigidiusculus, teres, sulcatus, ad 5 mm. diametro, glabrescens, nodis basi praecipue incrassatis. *Folia* oblique lanceolata, apice attenuata, basi valde oblique cordata, 3·5–7 cm. longa, 1·5–3 cm. lata, membranacea vel subchartacea, supra breviter setulosa, subtus glabra nisi nervis pilis brevibus parce instructis, margine serrato vel dentato, e basi 3–5-nervia, nervis cum nervulis supra subobscuris subtus prominulis; petioli ad 6·5 cm. longi, glabri; stipulae subdeciduae, oblique lanceolatae, apice attenuatae, circiter 1 cm. longae, 3 mm. latae, margine fimbriato, nervis conspicuis. *Racemi* vel solitarii terminales tantum vel ramulos breves axillares quoque terminantes; pedicelli ad 7 mm. longi, graciles, medio bracteolis duobus parvis deciduis scariosis ornati. ♂: *Sepala* 2, late elliptica vel subrotundata, apice obtusa, ad 5·5 mm. longa 4 mm. lata. *Petala* 2, late lanceolata, 2·5 mm. longa, 1 mm. lata. *Filamenta* brevia, basi connata, connectivo in appendicem triangularem membranaceam producto. ♀: *Perianthii* segmenta 5, exteriora late elliptica vel subrotundata, ad 6 mm. longa, 4·5 mm. lata, interiora late lanceolata, 5 mm. longa, 2 mm. lata, omnia mucronata. *Styli* 3, breviter connati, stigmatibus 3 lunatis. *Capsula* ut visa immatura, 9 mm. alta 11 mm. lata, alis chartaceis valde inaequalibus, loculis 3, placentis bifidis.

Chiengmai, in crevices on damp rocks on Doi Sootep, 1350 m., *Kerr*, 785.

**Begonia**, sp. n.?
Chiengmai, Doi Sootep, 660–900 m., *Kerr*, 557.
Represented by male flowers only. It is closely allied to some of the Yunnan *Begonias* collected by Henry. Dr. Kerr remarks that the stem is edible and tastes like rhubarb.

## Umbelliferae.

**Hydrocotyle javanica**, *Thunb.*—F.B.I., ii. p. 667; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 61.
Chiengmai, Doi Sootep, 900 m., *Kerr*, 1258.
*Distr.* Tropics.

**Hydrocotyle siamica**, *Craib*, sp. n., ab affini *H. Hookeri* (C. B. Clarke, pro var.), pedicellis multo longioribus facile distinguenda.

*Herba* repens, ad nodos interdum radicans. *Folia* pentagona, vix vel fere ad medium lobata, ad 9 cm. longa et 10 cm. lata, utrinque parcissime setulosa et praeterea nervis subtus puberula, e basi 7–9-nervia, nervis supra conspicuis subtus prominulis; petioli ad 15 cm. longi. *Umbellae* axillares, solitariae, pedunculo ad 10·5 cm. longo brunneo-puberulo suffultae. *Pedicelli* ad 8 mm. longi, glabri vel pilis perpaucis rigidiusculis deciduis instructi, basi conspicue bracteati. *Calycis* dentes deficientes. *Petala* subviridia, oblonga,

apice acuta incurva, 1 mm. longa, vix ·5 mm. lata, glabra. *Antherae* oblongae, filamentis circiter 1 mm. longis dorso affixae. *Styli* persistentes, ad 1·5 mm. longi. *Fructus* a latere compressus, 1·5 mm. altus, 2 mm. latus, jugis exceptis pilis albis brevibus obtusis rigidis instructus.

Chiengmai, Doi Sootep, 1200–1650 m., *Kerr*, 670, *Hosseus*, 192.

For uniformity with the Flora of British India the Siam plant might have been treated as a variety of *H. javanica* but in the writer's opinion the variety *Hookeri*, C. B. Clarke, of *H. javanica* should be raised to specific rank as should also the variety *chinensis*, Dunn, of the same species. These three species *H. chinensis*, *H. Hookeri*, and *H. siamica*, form a very natural group distinguished from *H. javanica* by their solitary generally long peduncled umbels.

**Eryngium foetidum**, *Linn.*

Chiengmai, Doi Sootep, 720 m., *Kerr*, 738.

*Distr.* Burma, Assam, Trop. Africa and America.

Dr. Kerr remarks that the leaves, which are strongly aromatic, are eaten with curries.

**Seseli siamicum**, *Craib*, sp. n., ex affinitate *S. yunnanensis*, Franch., sed foliis sine articulis, radiis paulo longioribus, involucelli bracteis liberis, pedicellis longioribus, calycis dentibus minutis differt.

*Herba* erecta, 5 dm.–1 m. alta, glaberrima ; radix fusiformis, apice foliorum vestigiis vestita ; caules solitarii vel gemini, superne ramosi, ad 3 mm. diametro, rigidi, striati. *Folia* basilaria et inferiora 6–11 cm. longa, 8–15 cm. lata, decomposita, segmentis ultimis linearibus ad 4 cm. longis 1·5 mm. latis, petiolis ad 15 cm. longis caules amplectantibus, media et superiora bipinnata, trifoliolata tantum, vel ad vaginas reducta. *Pedunculi* ad 10·5 cm. longi. *Involucrum* nullum vel monophyllum ad 1 cm. longum, margine membranaceo ; radii 4–8 subaequales, 3–4·3 cm. longi. *Involucelli* bracteae lanceolatae, quam pedicellis dimidio breviores, liberae. *Pedicelli* ad 7 mm. longi. *Calycis* dentes minuti. *Petala* alba, acumine inflexo. *Styli* perbreves. *Fructus* ovoideus, 3 mm. longus, 1·5 mm. diametro.

Chiengmai, Eng jungle on Doi Sootep, 300–750 m., *Kerr*, 774.

## Araliaceae.

**Heptapleurum venulosum**, *Seem.*, var. **macrophylla**, *C. B. Clarke*, F.B.I., ii. p. 729. *H. venulosum*, Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 62.

Chiengmai, Doi Sootep, 300–450 m., *Kerr*, 555.

*Distr.* (of var.). Burma.

Lao name, Mai Gin Pet.

**Brassaiopsis speciosa**, *Dcne. et Planch.*—F.B.I., ii. p. 737.

Chiengmai, in evergreen jungle on Doi Sootep, 660 m., *Kerr*, 1170.

*Distr.* Himalaya, Assam, Yunnan, Java.

## Alangiaceae.

**Alangium begoniifolium**, *Wang.* *Marlea begoniaefolia*, Roxb.—F.B.I., ii. p. 743 ; For. Fl. Burma, i. p. 544 ; Coll. et Hemsl., Journ. Linn. Soc., xxviii. p. 62.

Chiengmai, Doi Sootep, 900 m., *Kerr*, 1121.
*Distr.* India, China, Japan, Malaya.

Alangium Kurzii, *Craib*, nom. nov. *Marlea tomentosa*, Kurz, For. Fl. Burma, i. p. 545, *non* Endl.
Chiengmai, Doi Sootep, 660 m., *Kerr*, 1172.
*Distr.* Burma (in Herb. Calc.).
Wangerin, in his monograph of the *Alangiaceae* in Engler's Pflanzenreich, quotes Kurz, For. Fl. Burma, for the true *Marlea tomentosa*, Endl. The description given by Kurz does not, however, agree with the Java specimens, *e.g.*, in the size of the flower and in the indumentum of the under surface of the leaf. On the other hand, Kurz's description applies very well to the plant quoted above, which is, in the writer's opinion, the *M. tomentosa*, Kurz *non* Endl. It may be noted that no Burmese specimen is quoted as having been seen by Wangerin.

Alangium salviifolium, *Wang.*, sub-sp. hexapetalum, *Wang. A. Lamarckii*, Thwaites—F.B.I., ii. p. 741.
Ban Meh Chang, 300 m., *Kerr*, 979; Chiengmai, 300 m., *Hosseus*, 440.
*Distr.* India, Andamans, Malaya, Philippines, Comoro Is.
Lao name, Mai Poo (ex *Kerr*).

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## II.—A PINE DISEASE.

(*Diplodia pinea*, Kickx.)

K. Bancroft.

A disease affecting various species of *Pinus* was reported from widely separated districts in England during the years 1903 to 1906. In March, 1906, Massee investigated the disease and showed by infection experiments that it was caused by the fungus *Diplodia pinea*. The fungus has also been recorded in France, Belgium and Italy.

During the early part of 1910 a consignment of diseased shoots of *Pinus insignis* and *Pinus montana* was received from the eastern forests of Cape Colony. An examination showed that in every case the disease was caused by the above-mentioned fungus. The consignment furnished material for an investigation, under Mr. Massee's direction, of the mode of entrance of the fungus and of its range of hosts.

The disease is confined to the terminal portion of the shoots, and can be recognised by the yellowing and subsequent shedding of the leaves, and the death of the terminal portion of the shoots. The exact length of that part of the shoot which succumbs depends on the distance of the point of infection from the apex of the shoot; most usually the terminal ten or eighteen inches die. The dead shoots remain attached and furnish successive crops of spores of the fungus. The spores are produced in small, black perithecia which are found in abundance on the affected shoots and are visible to the naked eye as minute black dots; they can usually be observed on the affected leaves, though here they occur less frequently than on

the shoots. The spores are evidently wind-borne and are thus transferred from diseased to healthy parts of the shoots.

The hyphae of the fungus occur in abundance in the infected shoots and leaves ; they are colourless when young and become darker in colour as they grow older, the old hyphae being of a dark-brown colour ; they are septate at frequent intervals and measure on the average 5–6 $\mu$ in width. The hyphae are most frequently met with in the cortex and phloem, but sometimes they extend into the wood along the medullary rays. The tissues which are more especially affected are those which serve as channels for the conduction of elaborated food material. The resultant effect of an attack of the disease is the diminution of the food material available for the growth of the plant.

In the experiments which were conducted at Kew for the purpose of determining the mode of entrance of the fungus into the tissues and its variety of hosts the following species were employed :—

*Pinus sylvestris*, *P. Strobus*, *P. insignis*, *P. Pinaster*, *P. montana*, *Picea excelsa*, *Abies pectinata*, and *Larix europaea*. The plants were three years old, and in each case three plants were infected and one kept as a control.

Various attempts were made to infect the leaves and the younger and the older parts of the shoots by transferring the spores of the fungus to the unbroken surface in a drop of distilled water. The plants were kept in a greenhouse at a temperature of 75° F., and five attempts were made on each plant. The capacity for germination of the spores was previously tested by mounting them in water in a hanging-drop and germination was found to be active, taking place within 24 hours. All attempts to infect at an unbroken surface failed.

By similar experiments it was found that infection could occur readily at a wound ; it was demonstrated that only a small wound, such as a puncture, was sufficient, the spores being transferred to a drop of water on the puncture. Positive results were obtained only with the species of *Pinus* ; repeated attempts failed to produce any infection of the species of *Picea*, *Abies* and *Larix*.

The species of *Pinus* showed a yellowing of the leaves within seven weeks of the time of infecting ; this yellowing was followed by the death of the shoot and the shedding of the leaves. The mycelium was found to travel not more than 3 inches below the point of infection. The distance, therefore, to which an infected shoot dies depends on the position of the point of infection. The mycelium of the fungus could be traced in the affected shoots with some degree of facility at the end of seven weeks after the time of infection. Four months after infection no perithecia had been produced on the dead parts.

The results of the experiments were in accordance with those which were obtained by Massee and which were published in the Journal of the Board of Agriculture, vol. xiv., June, 1907, p. 165. With regard to the time of production of the perithecia, Massee concluded that the perithecia were not produced until the year following that of infection. My results showed that no perithecia were produced four months after infection.

The two conclusions which are of primary importance in connexion with the fungus are (1) that species of *Picea*, *Abies* and *Larix* appear to be immune to the disease, and (2) that it is only possible to infect species of *Pinus* at a broken or wounded surface.

The disease has been most commonly met with in the nursery, and it is here that measures should be taken to stop its spread. The removal and destruction of diseased parts should be carefully attended to. In the forest direct methods of treatment are scarcely practicable. In districts where the disease is known to occur it is advisable to avoid cultivating large areas with species of *Pinus*; the disease would be more easily kept under control by practising a mixed cultivation. It should be borne in mind that a close aggregation of large numbers of plants of the same kind favours the development and spread of an epidemic.

In connexion with the mode of entrance of the fungus Massee has mentioned in his publications, and I have also observed, that on the samples of diseased material received at Kew infection could be traced to small wounds on the bark. Such wounds are probably made by insects, and it is important that this point should be investigated. If these wounds can be traced to one or two species of insect in a district, it might be advisable that an attempt should be made to exterminate the insects.

In the above it has been only possible to indicate certain lines of investigation of the disease and of its method of treatment; further work has had to be postponed until some future period.

The fungus was originally described from France, and has since been recorded from Belgium, Italy and Finland, on dead needles of *Pinus sylvestris* and *Pinus montana*. Other species of *Diplodia* which occur on pines and are closely related to *Diplodia pinea* are *D. acicola*, Sacc., *D. conigena*, Desm., *D. sapinea*, Fries, the difference between these species being in the relative sizes of the spores. The following is a diagnosis of *Diplodia pinea*:—

Perithecia globose, erumpent; spores oblong, 35–40 × 16–18 $\mu$, stalked, at first continuous and yellowish, becoming later one-septate and fuliginous, not constricted at the septum.

Kickx.—Fl. Flandr. I, p. 397.

Massee.—Diseases of cultivated Plants and Trees, 1910, p. 574.

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## III.—SOME ADDITIONS TO THE LEGUMINOUS GENUS FORDIA.

S. T. Dunn.

Mr. Charles Ford while Superintendent of the Botanical Department at Hong Kong discovered on the banks of the West River in the Chinese Province of Kwangtung a remarkable Leguminous tree with crowded racemes of pink flowers growing upon the bare stem beneath a spreading canopy of large multifoliolate leaves. Specimens sent by him to Kew were subsequently described by Hemsley as the type of a new genus to which the name *Fordia* was given in his honour and the species was described under the name of *F. cauliflora*. As Hemsley pointed out, the tree

differed from all allied species then known in its multifoliolate (8–12-paired) leaves, rigid racemes of flowers borne on the old wood, 2-ovulate ovary and strophiolate seeds. It is true that in spite of these characters it might well have found a place within the heterogeneous collection of groups which, even at that time, constituted the genus *Millettia*, but its author judged, no doubt, that it was more for the convenience of botanists to found upon it a new genus than to add a fresh type to that already perplexing collection.

The object of this paper is to associate with *Fordia* several species of small trees inhabiting the Malayan islands which show a very complete agreement with the Chinese species in the structure of their inflorescence, flowers and fruit. The leaf characters of the genus, as thus extended, form a gradual transition towards those of *Millettia sericea* and allied species, while the occasional axillary position of the racemes in one of the species makes it a connecting link with the group of that genus to which *M. piscidia* belongs ; but these tendencies towards other types, while elucidating the systematic position of *Fordia*, are not sufficient to invalidate its individual status. A particularly constant feature appears to be the development of the 2-ovuled gynœcium into an oblanceolate pod with two seeds, enclosed between early-dehiscent coriaceous valves.

The five species of *Fordia*, including those now proposed, inhabit S. E. China, Borneo and Sumatra, that is to say, the northern and southern shores of the S. China Sea and if, as is likely, further research reveals these or additional species in the Philippine Islands and Indo-China, it will be one more genus which, like *Illigera*, entirely surrounds this almost isolated basin.

### Clavis Specierum.

Foliola stipellata ... ... ... ... 1. *F. cauliflora.*
Stipellae nullae
  Foliola coriacea ... ... ... ... 2. *F. coriacea.*
  Foliola papyracea
    Flores subsessiles
      Foliola glabra, terminale 15 cm. longum ... ... ... 3. *F. stipularis.*
      Foliola subtus subsericea, terminale 25 cm. longum ... 4. *F. Gibbsiae.*
    Flores graciliter pedicellati ... ... 5. *F. filipes.*

1. **F. cauliflora**, *Hemsl.* Enum. Pl. China, i. (1886) 160, t. 4.
China. Kwangtung : West River, *Ford.*

The trees in the Botanic Garden at Hong Kong are now some 12 feet high and have spread by throwing up shoots from the ground over a considerable area round their original position ; they bear every year upon their bare stems, now some inches thick, an abundance of pink-flowered racemes.

2. **F. coriacea**, *Dunn*, sp. n. *Arbor* parva ; ramulis glabris griseis lenticellatis. *Folia* 5–8-juga, 40–60 cm. longa, rachide glabra exstipulata ; foliola anguste lanceolata, apice gradatim acuminata, basi acuta, 12–15 cm. longa, rigide coriacea, supra glabra, subtus pilis adpressis sericeis nitentia tarde glabra, costa utrinque

prominula, venis secundariis ascendentibus marginem propinquantibus 8-paribus exstipellatis. *Racemi* in caulibus veteribus fasciculati, ad 15 cm. longi, ebracteati, breviter pedunculati. *Flores* in nodis nonnunquam ad 4 mm. productis fasciculati, 1 cm. longi, subsessiles. *Calyx* breviter campanulatus, tandem latior, 2 mm. longus, obscure lobatus, puberulus. *Vexilli* lamina rotundata, basi maculis duabus notata, extus sericea ; alae carinaque aequilongae. *Stamina* diadelpha? *Ovarium* 2-ovulatum.

*Millettia coriacea*, Dunn, MS.

Borneo. Kuching, *Haviland*, 2902, *Hewitt*, March, 1893 ; Sarawak : Baram District, *Hose*, 75 : Selabat, *Haviland*.

3. **F. stipularis**, *Dunn*, nom. nov. *Millettia stipularis*, Prain in Journ. As. Soc. Beng. xlvi. ii. (1897) 363.

Sumatra. *Forbes*, 2948.

4. **F. Gibbsiae**, *Dunn* and *Baker f.*, ined.

*Haviland* and *Hose*, 3280, *Hose*, 334 and *Barber*, 36, all from the island of Borneo, agree with specimens collected by Miss Gibbs in that island and are named in her honour. They will be described by Mr. E. G. Baker and myself in the paper which will shortly be published upon the subject of her collections.

5. **F. filipes**, *Dunn*, sp. nov. *Arbor* parva? inflorescentiis exceptis glabra ; ramulis griseis lenticellatis. *Folia* 4-juga, 20–30 cm. longa, exstipulata ; foliola lanceolata, acuminata, caudata, basi acuta, 8–15 cm. longa, chartacea, venis marginem propinquantibus utrinque 8, stipellis 0. *Racemi* axillares et laterales, fasciculati, fere ad basin nodosi, rachide puberula. *Flores* in nodis 1–4-ni, 1 cm. longi, pedicellis gracilibus, 3–5 mm. longis, puberulis. *Calyx* breviter campanulatus, tandem crateriformis, 2–3 mm. longus, tenuissime sericeus, lobis obscuris, basi bracteolis duabus minutis suffultus. *Vexilli* lamina rotundata, cordata, basi bimaculata, dorso sericea, rubella. *Alae* carinaque aequilongae. *Stamina* diadelphia, vexillare medio paullo connatum. *Ovarium* sericeum, 2-ovulatum.

*Millettia filipes*, Dunn, MS.

Borneo. Kuching, *Haviland*, 2893, 2903.

## IV.—MISCELLANEOUS NOTES.

Mr. F. M. Bailey.—We note with pleasure, in the list of New Year Day Honours, that Mr. F. M. Bailey, Colonial Botanist, Brisbane, Queensland, has been appointed a Companion of the Most Distinguished Order of Saint Michael and Saint George.

Mr. F. C. McClellan.—We are informed that Mr. F. C. McClellan has been appointed Director of Agriculture, Zanzibar, in succession to Mr. R. N. Lyne, who, we learn, has been appointed Director of Agriculture, Mozambique.

Mr. M. T. Dawe.—We are informed that Mr. M. T. Dawe lately Officer-in-Charge and Superintendent of Forests in the Botanical, Forestry and Scientific Department, Uganda, has been appointed Director of Agriculture under the Mozambique Company.

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Mr. Harry Thomas, a member of the gardening staff of the Royal Botanic Gardens, has been appointed by the Secretary of State for India in Council, on the recommendation of Kew, a probationer gardener for service in India.

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**Visitors during 1910.**—3,546,302 visitors to the Royal Botanic Gardens have been recorded during the year 1910. These figures show an increase of 186,081 over those of the previous year and are the largest numbers on record. During the ten years 1900–1909, 20,023,749 persons have visited the gardens giving an average of 2,002,374. The total number of visitors on Sundays during 1910 was 1,614,085 and on weekdays 1,932,217.

Sunday visitors have increased by the large amount of 229,716 while the number of visitors on weekdays show a decrease of 43,635 from the figures of the previous year in spite of the fact that there were five Bank Holidays when as many as 424,010 persons visited the gardens as against 242,372 persons on the four Bank Holidays in 1909.

The greatest attendance on any one day was 152,454 on Whit-Monday, May 16th, being nearly 40,000 more than any figures previously recorded for a single day. The smallest number on any one day was 290 on November 3rd. The largest Sunday attendance was 91,058 on May 15th and the smallest 251. The former figures are about 20,000 in excess of those recorded for last year.

The detailed monthly returns are given below :—

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| January ... ... ... | 65,212 |
| February ... ... ... | 77,528 |
| March ... ... ... | 507,192 |
| April ... ... ... ... | 343,437 |
| May ... ... ... ... | 679,734 |
| June ... ... ... ... | 364,521 |
| July ... ... ... ... | 383,646 |
| August ... ... ... | 562,420 |
| September ... ... ... | 270,978 |
| October ... ... ... | 191,844 |
| November ... ... ... | 37,717 |
| December ... ... ... | 62,073 |
| | 3,546,302 |

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**Additions to Gardens, 1910.**—Additions to the collections of plants cultivated at the Royal Botanic Gardens, Kew, have been made during the year by exchanges with other gardens, private as well as

public, and by purchase from nurserymen and others. Contributions of plants and seeds received from botanic gardens include the following :—

Arnold Arboretum. A large number of trees and shrubs, and packets of seeds.
Calcutta. Wardian case of plants ; orchids and bulbs ; collections of seeds from the Himilaya.
Dunedin. Wardian case of plants ; seeds of New Zealand plants.
Jamaica. Two Wardian cases of ferns.
Java. Wardian case of plants.
Mauritius. Orchids.
Natal. Wardian case of Sansevierias, etc. ; seeds.
New York. Succulent and other plants.
Penang. Wardian case of plants.
Singapore. Two Wardian cases of plants ; box of orchids : seeds of palms, etc.
Sydney. Wardian case of plants ; collection of seeds.
United States Department of Agriculture. Collection of Opuntias.

Exchanges were made with the Botanic Gardens of Edinburgh, Glasnevin, Cambridge and Oxford, and with most of the European gardens upon whom Kew is largely dependent for seeds of those annual herbaceous plants which fail to produce seeds at Kew.

H.M. the King of Italy presented a quantity of seeds of *Ginkgo biloba*. Captain A. A. Dorrien-Smith, D.S.O., gave plants and seeds obtained by him in Western Australia. Mr. P. W. Davis, Bedford Park, sent a quantity of New Zealand ferns. Mr. Derring, British Vice-Consul, Manaos, Brazil, sent seeds of *Leopoldinia Piassaba*. Dr. Drake-Brockman, Berbera, presented seeds of *Cordeauxia edulis* (Yeheb). Lady Hanbury, La Mortola, Ventimiglia, presented succulents, and other plants and seeds. Mr. J. T. Hibbert gave a collection of bulbs and seeds from Namaqualand. Lt.-Col. Sir G. Holford, Tetbury, and Mr. G. F. Moore, Chardwar, presented hybrid *Cypripediums*. Mr. R. Hoffman, Streatham, presented a collection of *Caladiums*. Sir Everard im Thurn, Governor of Fiji, and Mr. H. Tilly, Moulmein, sent orchids. The Earl of Jersey presented a large orange tree. Monsieur J. H. de Lehaie, Mons, sent bamboos. Sir E. Loder, Bart., Horsham, gave plants of *Rhododendron Loderii*. The Natural History Museum, South Kensington, presented South African seeds. Dr. Perez, Teneriffe, sent seeds of *Oreodaphne foetens*, *Senecio cruentus*, and of other interesting plants from the Canary Islands. Sir H. Roscoe, West Horsley, presented a large specimen of *Leucadendron argenteum*. Mr. R. Tower, H.M. Minister, Mexico, sent seeds of *Parthenium argentatum* (Guayule rubber plant), and of other economic plants. Messrs. Sander & Sons, St. Albans, and Messrs. S. Low & Co., Enfield, presented orchids.

Among the seeds and plants of interest distributed from Kew during the year were the following :—*Cordeauxia edulis* (Yeheb) (seeds), *Dolichandrone platycalyx* (seeds), *Ginkgo biloba* (seeds), *Metrosideros tomentosa* (seeds), *Parthenium argentatum* (seeds), *Phormium tenax*, var. (seeds), *Platycarya strobilacea* (seeds), *Senecio cruentus* (seeds), *Zizania aquatica* (seeds), and tubers of " Helianti."

A large consignment of trees and shrubs was sent to the Arnold Arboretum; cuttings of *Salix* to the Forestry Department, British East Africa; plants and seeds to Darjeeling Botanic Garden; collections of greenhouse plants to St. Andrews and Leeds Universities; a collection of economic plants to Eton College for the botanic garden; bamboos to Monsieur J. H. de Lehaie and Monsieur Maurice de Vilmorin, etc., etc. There was a large demand for seeds ripened at Kew and offered for distribution in *Bulletin*, *Appendix* I., 1910.

In connection with the opening of Cambridge Cottage as a museum of British Forestry, the garden of the cottage, which is enclosed by its original walls pierced by two wrought-iron gates, has become accessible to the public.

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The largest consignment of new trees and shrubs received during the year was from the Arnold Arboretum. The Assistant Curator visited this establishment during the summer with the result that about 500 species and varieties were noted as desirable for the Kew collection. Almost all these were sent by Professor Sargent and arrived in perfect condition early in December. An experiment was made in bringing over fresh cuttings. The Assistant Curator returned on the "Campania" and, by the kindness of the Cunard officials, was allowed to place two baskets containing about 50 packets of cuttings in one of the cold storage rooms where the temperature during the voyage was kept at about 42° Fahr. Ten days elapsed between taking the cuttings from the plants in the Arnold Arboretum and placing them in the propagating frames at Kew, but although this was in mid-July, they arrived almost as fresh as when they were cut and only six sorts failed to strike root. Among the more interesting plants sent by Professor Sargent were a set of American Amelanchiers—a genus which badly needs revision; several new species of North American Æsculus, a set of dwarf American Crataegi, about 160 Chinese trees and shrubs introduced by Mr. E. H. Wilson, a set of American and Asiatic Willows, and such rare plants as *Leitneria floridanum*, *Larix Lyallii*, *Kalmia caroliniana* and *K. microphylla*, *Pinus pentaphylla*, *Pteroceltis Davidiana*, *Tripetaleia bracteata* and *Vaccinium membranaceum*. Of special interest was a new and undescribed species of *Hamamelis* from Missouri remarkable as flowering in spring like the Asiatic species; the only American species previously known, *H. virginica*, flowers in autumn.

Mr. Maurice L. de Vilmorin sent in March a most interesting consignment of new species raised by himself from Chinese seeds. The majority were unnamed, but amongst them were *Ailanthus sutchuenense*, and the beautiful and very distinct *Clematis chrysocoma* which has since flowered and been figured for the Botanical Magazine.

Messrs. Veitch have, as usual, been generous donors of their new Chinese plants and through them the following have been added to the Kew collection: *Meliosma cuneata*, *Picea complanata*, *Pterocarya hupehensis*, *Rosa Willmottiae*, *Rhododendron nigro-punctatum*, *Viburnum theiferum*, *V. buddleifolium* and *V. Davidii*, *Lonicera yunnanense*, *Tsuga yunnanense*.

From the Japanese authorities at the recent exhibition at Shepherd's Bush several Japanese trees, shrubs and seeds were received, amongst which the most noteworthy were two specimens of the Japanese Douglas fir (*Pseudotsuga japonica*); although in rather poor health they are on their own roots and hitherto this conifer has only been known in Britain by a few miserable grafted plants.

A packet of seeds of *Picea Breweriana*, hitherto the rarest of spruces, was sent by Miss Alice Eastwood, and germinated freely. Cuttings of *Populus Thevestiana* were brought from Algeria by the Assistant Director, some of which have taken root. This poplar is very distinct in its white bark and fastigiate habit.

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**Waterfowl.**—During the past year several additions by presentation and exchange have been made to the collection of Waterfowl in the Royal Botanic Gardens. They include—

A pair of black swans presented by the Royal Zoological Society, Dublin.

Two pairs of Garganey teal presented by H.M. Office of Works.

A pair of Magellan geese received in exchange from Col. C. G. Tottenham, Ballycurry, Ashford, Co. Wicklow, Ireland.

A pair of white-faced tree-ducks.

A pair of hybrid yellow-billed ducks, a red-crested Pochard drake and a maned goose received in exchange from the Zoological Society of London.

A Mandarin duck, a pair of common teal and two pintail ducks received in exchange from Messrs. McLean & Wormald, East Dereham, Norfolk.

A red-crested Pochard duck received in exchange from Mr. C. E. Inglis, Ball's Grove, Grantchester, Cambridge.

The black-necked swans nested again on one of the islands in the Lake and laid three eggs; two young birds were hatched, but only one was reared, which, unfortunately, got killed when four weeks old. Other birds reared at Kew during the year include 15 Carolinas, 4 sheldrakes and several call ducks, tufted ducks and the black variety of the mallard.

A pair of storks have been reared as usual.

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**Fish.**—Some interesting varieties of Goldfish were presented to Kew at the close of the Japan-British exhibition by the Tokyo Goldfish Trader's Association. These Goldfish are kept as pets and various transformed species are produced by the Japanese which are described in the official handbook of the Fisheries section of the Exhibition. The forms presented to Kew include a curious black variety with highly developed eyes and fins, called Demekin, and several goldfish with fan tails, the Shukin and Ranchin varieties and others. They have been placed in the lily tank in the T. range.

Some Golden Orfe have also been received in exchange from Mr. R. Beale, Raynes Park, S.W.

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**Official Visits.**—During the past year the vote for travelling expenses has been utilised as follows :—

The Director.—As Representative of Great Britain at the "1er Congrès International d'Agronomie Tropicale," at Brussels.

The Assistant Directer.—In connection with a visit to the Jardin d'Acclimatation, Villa Thuret, Antibes, and to the gardens of Lady Hanbury, La Mortola, Ventimiglia.

The Curator.—To visit various gardens and horticultural exhibitions in Belgium and Holland.

The Assistant Curator.—For the purpose of visiting the Arnold Arboretum of Harvard University, the New York Botanic Gardens, and other botanical establishments in N. America.

The Keeper of the Museums.—To study museum collections in Belgium and to visit various commercial centres in the North of England in connection with economic botanical enquiries.

Mr. Holland, Assistant in Museums.—To visit Hull in connection with the importation of botanical products, and to attend a meeting of the Museums Association at York.

Mr. Dallimore, Assistant in Museums.—To take part in the excursion of the Royal Scottish Arboricultural Society for the study of forestry in the Western Highlands of Scotland.

Mr. Cotton, Assistant in the Herbarium.—In connection with the Survey of Clare Island, Ireland, and also towards the investigation of the growth of *Ulva latissima* in relation to sewage in Belfast Lough and on the South Coast of England.

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**Museums.**—In a review of the work for the past year special mention must be made of the opening to the public, in June last, of the collection of exhibits illustrating British Forestry which is housed in Cambridge Cottage, formerly the residence of H.R.H. the late Duke of Cambridge. During the past few years through the kindness of numerous contributors whose donations have already been duly recorded in the *Bulletin*, it has been possible to acquire the material necessary to form the nucleus of such a collection.

At the close of the Japan-British Exhibition, held at Shepherd's Bush, a large and interesting collection of varied products was obtained and is now being dealt with.

As in former years an exhibit was prepared, mainly from material obtained from the Arboretum, and forwarded to the Bath and West and Southern Counties Society's Show, held at Rochester.

In the past year 175 contributors have presented a considerable number of miscellaneous products to the Museum, the more important donations having been, from time to time, recorded in the *Bulletin*. All available and fully labelled duplicate specimens have been distributed to various institutions including the following :— Museum, County Borough of Bolton ; Muncipal Museum, Warrington ; Natural History Museum and Art Gallery, Bristol ; Corporation Art Gallery, Oldham ; Museum, Botanic Gardens,

Sydney ; Forestry Department, University of Aberdeen ; Museum, Forest of Dean, &c.

As in previous years much of the time of the Museum Staff has necessarily been devoted to dealing with the increasing number of products received from commercial firms, colonial correspondents and others, for determination and for general information as to their properties and uses.

The rearrangement of specimens rendered necessary owing to the formation of a collection to illustrate British Forestry, and the alterations called for in connection with the reception of the Taitokuin Shrine [*Kew Bull.*, 1910, p. 396], have delayed the issue of a new edition of the Guide to the Timber Collection.

A much needed work was commenced in Museum No. I. where a third of the number of cases have been re-polished.

Individual members of the Staff attended the Tropical Products Congress at Brussels, the Meeting of the Museums Association at York, and the Annual Excursion of the Royal Scottish Arboricultural Society to the Fort William District of Scotland.

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**Presentations from the Japan-British Exhibition.**—In the dispersal of the large collections of Vegetable Products exhibited in the Japanese section of the Japan-British Exhibition held at Shepherd's Bush last year, the Commissioners in charge of the several sections have liberally presented much valuable and interesting material to the Museums of the Royal Botanic Gardens.

This when carefully selected and arranged in the Museums will go far to form complete representative series of the varied products of Japan, Formosa, Corea and Manchuria.

Special mention must be made of the Japanese Agricultural Section, presented in its entirety to the Board of Agriculture and Fisheries and transferred by the Board to Kew. From this collection, which includes food products, fruits preserved in fluid, fibres, matting materials, straw and straw-plaits, specimens illustrating plant diseases, &c., a large selection must necessarily be retained.

From the Forestry Section the bulk of the material asked for was obtained, including sections from a series of timber specimens cut to show the radial and tangential surfaces ; a collection of bamboos ; samples of several forms of edible fungi including "Shitake" or Jew's Ear fungus (*Hirneola polytricha*) largely consumed as food in China and Japan, together with illustrations showing its cultivation on tree trunks in Japan ; specimens of the wood and shavings of *Cupressus obtusa* with examples of fabrics and other articles made from the shavings ; wood and shavings of *Acanthopanax sciadophylloides* applied to uses similar to those of the above mentioned ; berries of the Haze tree (*Rhus succedanea*) and wax obtained from the berries ; tapped stems of the Lacquer tree (*Rhus vernicifera*), and a photograph to illustrate the method employed in tapping the stems for the collection of Lacquer ; galls formed on *Rhus semialata*, together with a coloured drawing of the same. Other valuable material was obtained from this Section, including a collection of Forest tree seeds from the Japan Seed and Plant Company.

From the Corean Section the collection of miscellaneous vegetable products was secured, including fibres, food grains, tobacco, ginseng, and a series of timbers.

The Formosan Section contained a particularly interesting and varied series of products. Among those especially desired and obtained for the Museums the following may be noted :—Stem of the Bird-lime tree (*Trochodendron aralioides*); stem and rubber of *Ecdysanthera utilis*; Rice paper products consisting of stems, pith, sheets of pith prepared for the use of artists and for the manufacture of artificial flowers, and plaits formed of the pith for use in millinery; samples of tea, sugar cane, various fibres and fabrics; some fine examples of hats in imitation of the Panama hat, made from the prepared leaves of the Areca Nut Palm (*Areca Catechu*), and from a species of *Pandanus*, and some hats of the "Taiko" rush, a darker coloured material, so far undetermined.

The Manchurian collection of Agricultural Products containing much material of value for the Museum collections was secured, together with several oil vessels used in the Soy bean industry, samples of bean cake and a coloured photograph to illustrate the shipping of bean cake from Dairen. These latter were presented by the South Manchurian Railway Company.

The Japan Exhibitors' Association presented a neatly made tub in which Soy is packed for export.

The Japanese Educational Section presented several cases of insects injurious to plant life, together with some examples of abnormal growths and thirty small sections of timber exhibited by the Morioka Higher School of Agriculture and Forestry; some interesting photographs and a book of impressions of type leaves of *Morus alba* from the Osaka Agricultural School were also presented. Two cases of plant diseases from the University of Tohoku, Sapporo, were at the request of Prof. Miyabe likewise transferred to Kew.

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**Research in Jodrell Laboratory in 1910 :—**


**Bancroft, C. K.**—Researches on the Life-history of Parasitic Fungi. (Ann. Bot., Vol. XXIV., pp. 359–372, t. 24.)

**Bancroft, C. K.**—A Disease of the Cacao Plant. (Kew Bull., 1910, pp. 93–95.)

**Bancroft, C. K.**—The Brown Rot of Tomato. (Journ. Board Agric., Vol. XVI., p. 1012.)

**Boodle, L. A.**—Galls on an Indian Grass. (Kew Bull., 1910, pp. 69–73, with one plate.)

**Georgevitch, P.**—*Bacillus thermophilus vranjensis.* (Archiv für Hygiene, Bd. LXXII., pp. 201–210.)

**Georgevitch, P.**—Preliminary note on Apospory and Apogamy in *Trichomanes Kaulfussii*, Hk. et Grev. (Ann. Bot., Vol. XXIV., pp. 233–234.)

**Georgevitch, P.**—Aposporie und Apogamie bei *Trichomanes Kaulfussii*, Hk. et Grev. (Jahrb. für wiss. Bot., Bd. XLVIII., pp. 155–170, with 30 Figs. in text.)

**Groom, P.**—Remarks on the Oecology of Coniferae. (Ann. Bot., Vol. XXIV., pp. 241–269.)

Lawson, A. A.—The Gametophytes and Embryo of *Sciadopitys verticillata*. (Ann. Bot., Vol. XXIV., pp. 403–421, tt. 29–31.)

[Massee, G.]—Leaf Diseases of Celery. (Journ. Board Agric., Vol. XVI., pp. 1,010–1,011, with Figs. in text.)

[Massee, G.]—Wart Disease of Potatoes checked by "Greening." (Journ. Board Agric., Vol. XVII., pp. 46–47.)

[Massee, G.]—A Disease of Fig Trees. (Journ. Board Agric., Vol. XVII., pp. 47–49, with one Fig. in text.)

[Massee, G.]—Shot-hole Fungus (*Cercospora circumscissa*, Sacc.). (Journ. Board Agric., Vol. XVII., pp. 211–214, with half a plate.)

[Massee, G.]—Cauliflower Disease of Strawberries. (Journ. Board Agric., Vol. XVII., p. 214, with half a plate.)

[Massee, G.]—Tomato and Potato Bacteriosis. (Journ. Board Agric., Vol. XVII., pp. 297–299, with one plate.)

[Massee, G.]—Strawberry Leaf-Spot. (Journ. Board Agric., Vol. XVII., pp. 476–477, with one plate.)

[Massee, G.]—On the Occurrence of "Crown-Gall" in England. (Journ. Board Agric., Vol. XVII., pp. 617–620, with one plate.

Massee, G.—Crown-Gall (*Dendrophagus globosus*, Tourney). (Kew Bull., 1910, pp. 309–312, with one plate.)

[Massee, G.]—Powdery Mildew of Peach and Cherry. (Journ. Board Agric., Vol. XVII., pp. 652–653, with one plate.)

Scott, D. H. and Maslen, A. J.—On *Mesoxylon*, a New Genus of Cordaitales. Preliminary Note. (Ann. Bot., Vol. XXIV., pp. 236–239.)

Stephens, E. L. and Sykes, M. G.—Preliminary Note on Apogamy in *Pteris Droogmantiana*. (Ann. Bot., Vol. XXIV., p. 487.)

Worsdell, W. C.—The Rhizophore of *Selaginella*. (New Phytologist, Vol. IX., pp. 242–253, with two Figs. in text.)

Mr. C. K. Bancroft completed his study of *Cladosporium herbarum*, and carried on other mycological researches : see above.

Mr. L. A. Boodle finished an investigation on an insect-gall on a grass (*Ischaemum pilosum*), and studied the floral histology of *Foetidia mauritiana*, and continued some cultural experiments with seedlings : see above.

Mr. R. C. Davie studied the anatomy of *Peranema cyatheoides*, Don, an Indian Fern, with the object of determining its true affinities.

Mr. J. Fraser, on behalf of Lord Avebury, continued the study of pollen, begun in the previous year.

Mr. A. J. Maslen completed his work on the anatomy of *Mesoxylon Sutcliffii* : see above.

Dr. T. Nicoloff investigated some points in the anatomy of the secondary wood in Dicotyledons.

Mr. H. Takeda studied the floral structure of *Achlys*, and the characters of the seed in some species of *Cerastium*.

Mr. W. C. Worsdell continued his investigations on the vascular anatomy of the Dicotyledons, more particularly the Cucurbitaceae.

**Pathology.**—The number of reports issued continues to increase yearly, and the samples of material received, as well as the tone of the queries, clearly indicate that farmers and horticulturists are beginning to realise that parasitic fungi and injurious insects are factors that cannot be ignored with impunity. "Corky Scab," caused by *Spongospora solani*, has been the most prevalent disease of potatoes during the past year. "Crown-Gall," an infectious disease, forming large galls at the collar or on the roots of many economic trees and plants, has been seen on plum, rose, chrysanthemum, raspberry and loganberry, during the past year.

Much time has been devoted to the investigation of algae and fungi occurring in sewage, and contaminated sea and river water. The investigation, commenced the previous year, on the fungi causing discoloured spots on chilled beef from Argentina, has been continued.

A considerable amount of diseased material, more especially cacas, rubber plants, oranges and pineapples has been received at Kew for investigation, from the Cape of Good Hope, Natal, West Indies, Singapore, Federated Malay States, New Zealand, etc.

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**Additions to the Herbarium during 1910.**—During the year rather more than 16,000 specimens were received as donations or exchanges, while 11,350 were acquired by purchase. The principal collections are enumerated below.

Europe. *Presented :*—Fungi, by Abate G. Bresadola.

*Purchased :*—E. M. Holmes, "Algae Britanicae Rariores Exsiccatae," fasc. 12; H. Sydow, "Mycotheca Germanica," fasc. 18–19; W. Tranzschel and J. Serebrianikow, "Mycotheca Rossica," fasc. 1–2; A. Kneucker, "Gramineae et Cyperaceae Exsiccatae"; Fiori, Béguinot and Pampinini, "Flora Italica Exsiccata," Cent. xi.–xiv.

Orient, North Asia and North Africa. *Presented :*—Persia, by Mr. W. Ethelbert James; Manchuria, by the Royal Botanic Gardens, St. Petersburg; Algeria, by Mr. A. W. Hill.

*Purchased :*—Dr. Reno Muschler, Egypt.

China and Japan. *Presented :*—China, Cavalerie and Esquirol, through Monseigneur A. A. H. Léveillé; Shantung, F. N. Meyer; Japan, H. Takeda.

*Purchased :*—T. Taquet, Corea; E. H. Wilson, China (photographs).

India and Malaya. *Presented :*—Burma, Mr. J. H. Lace; Tibet, Sikkim and the Malay Peninsula, by the Royal Botanic Garden, Calcutta; North-West Frontier Province, the late Sir Harold Deane through Lady Deane; specimens of Indian *Pedicularis*, by Messrs. J. R. Drummond and J. F. Duthie; Malay Peninsula, by Mr. H. N. Ridley; Siam, by Dr. A. F. G. Kerr and Mr. W. Lloyd; Philippine Islands, by Mr. E. D. Merrill; Java, by the Buitenzorg Botanic Gardens; Sumatra, etc., by Dr. R. Schlechter; Borneo, by the Sarawak Museum, through Mr. J. C. Moulton.

*Purchased :*—Dr. R. Schlechter, New Guinea; Mr. A. D. E. Elmer, Philippine Islands.

Australasia. *Presented:*—Western Australia, by Capt. A. Dorrien Smith ; Queensland Marine Algae, by Mr. F. M. Bailey ; New Zealand, by Mr. T. F. Cheeseman and Mr. L. Cockayne.

Tropical Africa. *Presented:*—Northern Nigeria, by Mr. B. E. B. Shaw ; Sudan, by Mr. and Mrs. A. F. Broun ; Abyssinia and Somaliland, by Dr. R. E. Drake-Brockman ; British East Africa, by Mr. E. Battiscombe ; Uganda, by Mr. M. T. Dawe and Mr. R. Fyffe ; the Roosevelt Expedition, through Mr. Gerrit S. Miller ; Swaziland, by Miss M. M. Stewart ; Rhodesia, by Mrs. W. Craster ; *Loranthaceae*, by the Royal Botanic Gardens, Berlin.

*Purchased :*—G. Tessmann, Spanish Guinea ; G. Zenker, Cameroons ; G. Scheffler, British East Africa ; Rev. F. A. Rogers, North-West Rhodesia ; K. Dinter, German South-West Africa.

South Africa. *Presented :*—Namaqualand, by the Percy Sladen Trustees, through Prof. H. H. W. Pearson ; various localities, by Dr. R. Schlechter, Dr. Hans Schinz, Dr. S. Schönland, Mr. E. E. Galpin and Mr. E. P. Phillips.

*Purchased* :—Miss Alice Pegler, Kentani ; W. Tyson, " Marine Algae," fasc. 1–2.

North America. *Presented :*—British Columbia, by Miss E. M. Warren ; United States, by the Smithsonian Institution, Washington, and the Field Museum, Chicago.

*Purchased :*—E. J. Palmer, Missouri *Crataegi ;* Miss Alice Eastwood, Santa Barbara, California : A. H. Brinkman, Canadian mosses ; F. S. Collins, " Phycotheca Boreali-Americana " fasc. 33.

Mexico. *Purchased :*—C. R. Orcutt.

West Indies. *Presented :*—Bahamas and Jamaica, by the New York Botanical Gardens.

*Purchased :*—H. Türckheim, San Domingo.

South America. *Presented :*—British Guiana, by Prof. J. B. Harrison, C.M.G. ; South Brazil and Chile, Mr. G. M. Hall.

*Purchased :*—Dr. E. Hassler and K. Fiebrig, Paraguay.

Sir G. Watt has presented the original drawings, as well as many specimens of *Gossypium*, used in the preparation of his book on " The wild and cultivated Cotton Plants of the World." An extensive set of Manchurian plants, collected largely by Komarow, has been received from the Royal Botanic Gardens, St. Petersburg. A collection of nearly 800 photographs taken in China by Mr. E. H. Wilson gives a good idea of the vegetation of the region traversed by him ; some of these views have been reproduced in the Kew Bulletin. The Indian specimens of *Pedicularis* presented by Mr. J. R. Drummond and Mr. J. F. Duthie have been named by Monsieur G. Bonati, who is making a special study of the genus. Mr. J. F. Lace's collection is represented by nearly a thousand specimens. Dr. A. F. G. Kerr has continued sending plants from Chiengmai in Siam, and also one set collected during an expedition to Muang Phre, south-east of Chiengmai. Amongst the plants sent from the Philippine Islands by Mr. E. D. Merrill are some orchids named by Mr. Oakes Ames. Mr. T. F. Cheeseman has presented some of the specimens used in the preparation of his " Illustrations of the New Zealand Flora." An interesting collection, containing many Cryptogams, from South Chile, has been presented by Mr. G. M. Hall.

In addition to the numbers mentioned above, about 8000 specimens have been received on loan from various institutions, chiefly for use in the preparation of the Flora of Tropical Africa and the Flora Capensis.

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**Presentations to the Library during 1910.**—One of the more important of the contributions made to the Library during the year is a copy of the rare and valuable work on roses by Miss Mary Lawrance, for which the establishment is indebted to the Bentham Trustees. Its full title is: *A collection of Roses from Nature;* published by Miss Lawrance, Teacher of Botanical Drawing. The title-page bears the date 1799, but the plates, of which there should be 90, in addition to a coloured frontispiece, are variously dated from 1796 to 1799. Perfect copies of the work appear to be very rare, and the Kew copy is deficient in the frontispiece and plate 1. The volume is a nearly square folio standing 19 inches high. The coloured drawings, though somewhat adversely criticised by Redouté, "parce que, dans un grand nombre d'occasions, le peintre a sacrifié la vérité aux formes pittoresques," have considerable merit as works of art.

The Bentham Trustees have also presented a copy of *Der orientalisch-indianische Kunst- und Lust-Gärtner*, by G. Meister, published in Dresden in 1692. It is a small quarto volume containing many curious observations on fruit and fruit-culture, amongst other things, made by the author during his travels to Japan through India, Siam, Java, &c. From the same source have been received the following: *Wissenschaftliche Ergebnisse der deutschen Tiefsee-Expedition auf dem Dampfer Valdivia*, 1898–1899, Bd. ii. Teil iii. *Das Kapland*, by R. Marloth, Jena, 1908; two copies of the fifth volume of *The Trees of Great Britain and Ireland*, by H. J. Elwes and A. Henry; *Nova Acta Academiae C. L.-C. G. Naturae Curiosorum*, vols. 85–89, in continuation; 16 volumes comprising travels in South America and the little known *Flora de Colombia* by Santiago Cortes, Bogotá, 1897; and the issues for the year of nearly thirty serial or periodical works, continuing sets which in most cases have been added to the library by the Bentham Trustees.

The Trustees of the British Museum have presented the third volume (L–O) of the fine *Catalogue of the Library of the British Museum* (*Natural History*), and the first volume of the *Flora of Jamaica*, by W. Fawcett and A. B. Rendle. This volume includes the Orchidaceae.

Through the kind offices of Mr. R. T. Tower, C.V.O., H.M. Minister, Mexico, numerous additions of Mexican publications have been received from the Acting Secretary of Fomento, Mexico, and the Librarian of the Instituto Médico Nacional de México. These include *Materia medica mexicana* (1904), and *Abrégé de matière médicale du Mexique* (1909), by F. Altamirano; *Manual terapeutico de plantas mexicanas* (1909), by L. Flores; *Curso de historia de drogas* (1902), by J. M. Noriega; and *Estudios de historia natural* (1904), by J. Ramírez.

A handsome volume and a very important contribution is the *Pteridografía del Sur de México*, by the late Señor J. N. Rovirosa. This has been received from Dr. J. Sánchez and Dr. M. M. Villada, who have communicated it in the name of Señor J. D. Casasús through whose generosity the publication of the work was secured.

Dr. Hans Schinz has presented the botanical publications of the University of Zurich, as well as *Die fossilen Pflanzenreste des glazialen Delta bei Kaltbrunn*, &c. (1910), by H. Brockmann-Jerosch, and a dissertation by E. Hess *Ueber die Wuchsformen der alpinen Geröllpflanzen* (1909).

The Compagnie du Kasai, Brussels, has issued a quarto volume recording the results of the botanical and agricultural researches of the company in the Kasai Region of the Belgian Congo, the material having been arranged and annotated by Dr. E. De Wildeman. The Compagnie du Kasai has presented a copy of the work to the library. From the Ministère des Colonies, Belgium, have been received *Sylloge florae congolanae* (1909), by Th. Durand and Hélène Durand, and *Notes botaniques sur la région du Bas- et Moyen-Congo*, fasc. 1 (1910), by J. Gillet and E. Pâque. The last named forms part of the *Annales du Musée du Congo*, of which all the botanical series have reached the library from the same source.

Two copies of the *Florae Libycae Prodromus*, by E. Durand and G. Barratte, a fine quarto volume containing twenty plates which are chiefly the work of that skilled artist Mr. d'Apreval, have been received, one from Madame Gallice in memory of her lamented brother, Dr. E. Durand, and the other from the Herbier Boissier.

Sir J. D. Hooker, O.M., G.C.S.I., has presented Landon's work, *Lhasa* (1905), and the continuation of numerous periodical publications.

A well-bound set of the *Revue des Eaux et Forêts*, comprising volumes 10 to 44 (1874–1905), has been presented by Mr. J. S. Gamble, C. I. E., and Mr. W. A. Talbot, has made a presentation of a copy of his fine *Forest Flora of the Bombay Presidency and Sind*, vol. 1 (1909).

A collection of 113 sectional maps of the Sudan have been received through the kind offices of Mr. A. F. Broun, Director of Woods and Forests to the Sudan Government.

The establishment is especially indebted to Mr. J. R. Drummond, for a transcript of the lists of determinations, localities and other information, contained in Mr. J. F. Duthie's Field Books relating to the collections of plants in the herbarium formed by Mr. Duthie for the Botanical Department of Northern India of which, up till 1903, he was Director. This herbarium, formerly at Saharanpur, is now at the Imperial Forest Research Institute, Dehra Dun. The transcript, which fills eight quarto volumes, each of about three hundred pages, has been made under Mr. Drummond's personal supervision and entirely at his expense.

The late Dr. John Lowe at the time of his death had accumulated a great amount of material in the form of manuscript notes, cuttings from books and papers and other matter with the intention of issuing a second edition of his monograph, *The Yew Trees of Great Britain and Ireland*. In this work he was assisted by Mrs. Lowe, who continued it after his death, with the co-operation of Mr. Augustine Henry and others. Unfortunately Mrs. Lowe did

not live to complete the preparation of the new edition and at her decease the project was abandoned. All the material collected, and this has been to some extent arranged by Mr. Henry, together with an annotated copy of the first edition of Dr. Lowe's book, has been presented to the library by Mrs. Lowe's executors.

The complete list of accessions to the library during the year, including many important presentations which it has not been possible to mention in this note, will form Appendix II to the current volume of the *Kew Bulletin*.

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**Bamboos cultivated at the Royal Botanic Gardens, Kew.**—From time to time enquiries are received with regard to the species of *Bambuseae* in cultivation at Kew ; a revised census of these, based on the Kew Handlists, and brought up to date, is therefore here given for general information.

Arundinaria anceps, *Mitford.*
„ argenteo-striata, *Hort.*
„ aristata, *Gamble.*
„ auricoma, *Mitford.*
„ chrysantha, *Mitford.*
„ falcata, *Nees.*
„ „ var. glomerata, *Gamble.*
„ Falconeri, *Mitford.*
„ Fortunei, *A. & C. Rivière.*
„ Hindsii, *Munro.*
„ „ var. graminea, *Bean.*
„ Hookeriana, *Munro.*
„ humilis, *Mitford.*
„ intermedia, *Munro.*
„ japonica, *Sieb. & Zucc.*
„ khasiana, *Munro.*
„ Kokantsik, *Kurz.*
„ Kumasasa, *Kurz.*
„ macrosperma, *Michx.*
„ „ var. tecta, *A. Gray.*
„ nitida, *Mitford.*
„ pumila, *Mitford.*
„ pygmaea, *Kurz.*
„ racemosa, *Munro.*
„ Simoni, *A. & C. Rivière.*
„ „ var. Chino, *Makino.*
„ „ „ variegata, *Hook. f.*
„ Veitchii, *N. E. Brown.*
Bambusa "Alphonse Karrii," *Hort.*
„ angustifolia, *Mitford.*
„ arundinacea, *Willd.*
„ disticha, *Mitford.*
„ himalayensis, *Hort.*
„ macroculmis, *A. Rivière.*
„ Nagashima, *Marliac.*
„ nana, *Roxb.*
„ „ var. variegata, *Hort.*
„ nepalense, *Hort.*

Bamboos cultivated at the Royal Botanic Gardens, Kew.—*cont.*

Bambusa quadrangularis, *Fenzi.*
„ tessellata, *Munro.*
„ vulgaris, *Schrad.*
„ „ var. striata, *Lodd.*
Cephalostachyum flavescens, *Kurz.*
„ pergracile, *Munro.*
Dendrocalamus giganteus, *Munro.*
„ latiflorus, *Munro.*
„ sikkimensis, *Gamble.*
„ strictus, *Nees.*
Gigantochloa atra, *Kurz.*
Melocanna bambusoides, *Trin.*
Olyra floribunda, *Raddi.*
Oxytenanthera abyssinica, *Munro.*
„ albo-ciliata, *Munro.*
Phyllostachys aurea, *A. & C. Rivière.*
„ bambusoides, *Sieb. & Zucc.*
„ fastuosa, *Hort.*
„ flexuosa, *A. & C. Rivière.*
„ fulva, *Mitford.*
„ Henonis, *Mitford.*
„ mitis, *A. & C. Rivière.*
„ nigra, *Munro.*
„ „ var. Boryana, *Hort.*
„ „ „ Castillonis, *Hort.*
„ „ „ punctata, *Bean.*
„ puberula, *Munro.*
„ Quilioi, *A. & C. Rivière.*
„ „ var. Marliacea, *Mitford.*
„ ruscifolia, *Hort. Kew.*
„ sulphurea, *A. & C. Rivière.*
„ violascens, *A. & C. Rivière.*
„ viridi-glaucescens, *A. & C. Rivière.*
Schizostachyum Zollingeri, *Steud.*

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Botanical Magazine for January.—The plants figured are *Dendrobium Dartoisianum*, De Wildem. (t. 8352); *Cladothamnus pyrolaeflorus*, Bongard (t. 8353); *Aquilegia flabellata*, Sieb. & Zucc. var. *nivea*, Hort. (t. 8354); *Aster Falconeri*, Hutchinson (t. 8355); and *Phaedranassa Carmioli*, Baker (t. 8356). The fine *Dendrobium* was discovered in 1905 in Indo-China and was introduced by Mr. G. Bronckart with another species from Annam bearing his name (t. 8252). *D. Dartoisianum* is most nearly allied to *D. tortile*, Lindl. The Kew plant was purchased in 1906 from Mr. M. Verdonck, of Ghent. The *Cladothamnus* is an interesting little Ericaceous shrub found growing along the borders of upland meadows in Alaska. The corolla is almost polypetalous, whereas in the allied species *C. campanulatus*, Greene, from the mountains of British Colombia and Washington there is a short corolla-tube. *C. pyrolaeflorus* was discovered on the island of Sitka by Dr. Martens in 1828. The material for the illustration was supplied by Mr. T. Smith, Daisy Hill Nursery, Newry. The *Aquilegia* is a white-

flowered form of the Japanese *A. flabellata*, which was sent to Kew by Canon Ellacombe, Bitton, Bristol, in May, 1909. Finet et Gagnepain suggest that *A. flabellata* may be only a variety of *A. sibirica*, Lam. but from the gardening point of view the plants are sufficiently distinct. *Aster Falconeri*, a native of the mountains surrounding the valley of Kashmir is a remarkably handsome species. It was originally considered identical with *A. diplostephoides*, Benth., from Sikkim and E. Nepal. Messrs. Barr introduced *A. Falconeri* to cultivation in 1906, and kindly presented seeds to Kew. The plants flowered in May, 1910, but the material for the illustration was provided by Mr. W. Marshall, Auchinraith, Bexley.

The genus *Phaedranassa* which furnishes the subject for the last illustration, *P. Carmioli* from Costa Rica, includes four other species from the Andes of Ecuador or Colombia. The flowers are striking with their long red perianth tubes and yellow-edged, green lobes. *P. Carmioli* was introduced by Mr. Jules Carmiol, and was first flowered in 1867. The plant figured was received from Mr. W. E. Gumbleton, Belgrove, Queenstown, to whom the bulb had been sent two years previously by Mr. W. E. Ledger, Wimbledon.

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**Pseuderanthemum malaccense**, *Lindau* in Engl. & Prantl, Nat. Pflanzenf. iv. $3^B$, p. 330.—This combination rests on *Eranthemum malaccense*, C. B.Cl.; but as Clarke himself at different times had different conceptions of that species, and as *E. malaccense* has, moreover, recently been referred to as a synonym of *E. graciliflorum*, Nees, it seems desirable to define the species. The name *Eranthemum malaccense* appears for the first time in C. B. Clarke's elaboration of the Acanthaceae for the Flora of British India, iv, p. 498 (1885). The specimens especially referred to it are "Griffith (Kew Distr. 6175), Cuming 2357, 2389, etc." They are all at Kew, and their comparison shows that one sheet of Griffith, namely, 6175, and Cuming, 2389, are conspecific whilst Cuming, 2357, represents another species. As to the synonyms quoted by Clarke, they are :—"*Eranthemum crenulatum*, Nees in Wall. Pl. As. Rar. iii, 107 and in DC. Prodr. xi, 453, chiefly; T. Anderson in Journ. Linn. Soc. ix. 523, partly (not of Lindl.); *E. palatiferum* Bot. Mag. t. 5957, left-hand fig. only; *Justicia orbiculata*, Wall. Cat. 2489, letter *b*; and from a note, possibly *E. punctatum*, Nees in DC. Prodr. xi. 455." When Clarke worked out the Acanthaceae for King and Gamble's Materials for a Flora of the Malayan Peninsula (Journ. As. Soc. Bengal, lxxiv, part ii, 1907) he considerably revised his determinations and quotations. He retained only Cuming's 2389 and a part of Griffith's 6175 in *E. malaccense*, referring Cuming 2357, to his *E. porphyranthos*, and the remaining part of Griffith's 6175, to *E. album*. At the same time he cut out all the synonyms quoted above with the exception of *E. crenulatum*, Nees "(in large part)," non Lindley. On the other hand, he added a considerable number of specimens, of which the following are at Kew :—Wellesley, *Ridley*, 2231; Malacca, *Harvey*; *Goodenough*, 1713; Mt. Ophir, *Lobb*. They are all conspecific with Cuming, 2389, and one of the Kew Distribution sheets of Griffith's collection numbered 6175. He further introduced

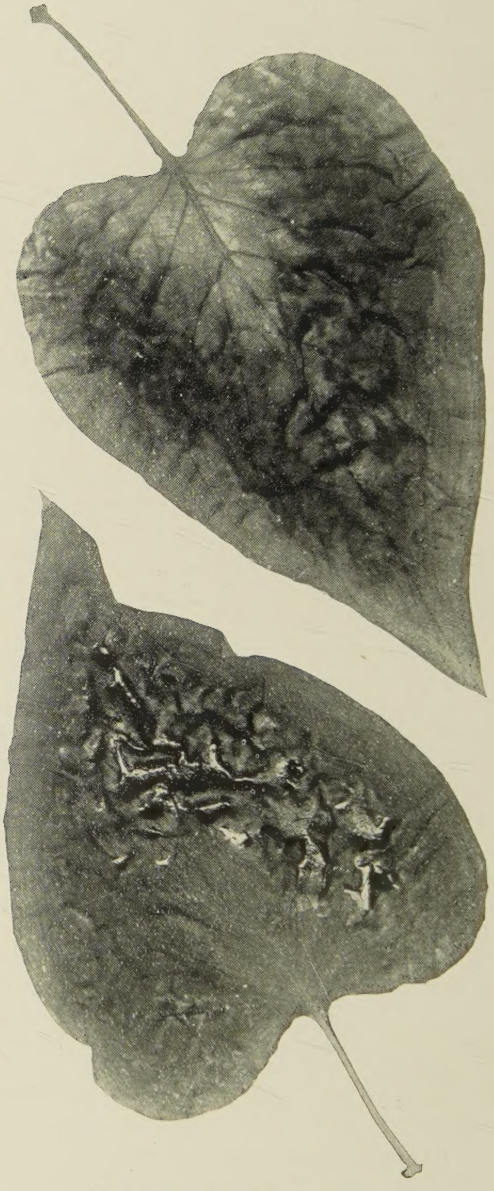
several new synonyms, namely *E. erectum*, T. Anders., *E. crenulatum* var. *grandiflorum*, T. Anders. and *E. Blumei*, T. Anders. (non Nees) ; but as these are all " nomina nuda," they need not be taken into consideration in this place, and the less so as they are not supported by any specimens in the Kew collections. *Eranthemum crenulatum*, however, requires some explanation. The plant originally so named by Wallich and figured in the Botanical Register, tab. 879, is undoubtedly Clarke's *E. porphyranthos* (in King and Gamble's Materials, p. 885, reprint p. 675), a native of Penang and Perak, and not of Silhet as Lindley believed, whilst *E. crenulatum*, Nees in Wall. Pl. As. Rar. iii, p. 107, is a mixture of several species, comprising *inter alia* Clarke's *E. malaccense*, as exemplified by Cuming's 2389, and by Lobb's and Griffith's specimen, all of which Nees quotes under his *E. crenulatum* var. *angustifolium*. The only synonym Nees mentions in connection with this variety is *Justicia orbiculata*, Wight in Wall. Cat. 2489, which Clarke also quoted under *E. malaceense* in the Flora of British India, l.c., whilst in the " Materials " it is referred to *Eranthemum album*, and in all probability rightly so.

Accepting Clarke's identifications in the " Materials," with the exception of a specimen from Siam, which is certainly specifically distinct, the area of his *Eranthemum malaccense* (= *Pseuderanthemum malaccense*, Lindau), covers the greater part of the Malay Peninsula from Kedah to Johore.

Not long ago Clarke's *E. malaccense* was identified by Beddome (in Journ. Hort. Soc., xxxiv. p. 71) with *E. graciliflorum*, Nees in Wall., Pl. As. Rar. iii. p. 107 and *E. punctatum*, Nees in DC. l. c. p. 455. The first is based on a specimen collected by Porter in Penang and preserved in Wallich's herbarium (2427) at the Linnean Society. The specimen is in a bad state of preservation with the corollas eaten away. Its leaves are larger than in any of the specimens of *P. malaccense* I have seen (up to 17 cm. by 3·5 cm.) and the petioles vary from 3–8 cm., instead of 1–2 cm. Nor is the pubescence of the stem of exactly the same nature as in *E. malaccense*, and the colour of the corolla is stated to be rose. To include Porter's specimen in Clarke's *E. malaccense*, involves the assumption of a range of variation which is by no means suggested by the material which I have seen of that species, which is remarkably homogeneous. In view of this and of the imperfect condition of the type of *E. graciliflorum*, I do not feel justified in accepting the reduction of *E. malaccense*, C.B. Cl., to *E. graciliflorum*, Nees. As to *E. punctatum* Nees, this was described from a plant of unknown origin grown in the Breslau Gardens. There are no specimens of it at Kew. The description, apart from the length (1–8 cm.) and colour of the corolla (pale red with purple confluent dots on the anticous middle lobe), suggests indeed *E. malaccense*, C.B. Cl., and it is just possible that the two are synonymous.

A description with revised references to literature and synonymy and a plate drawn from a specimen cultivated at Kew will appear at an early date in the Botanical Magazine.

O.S.



HELMINTHOSPORIUM SYRINGAE.

*To face page* 81.]